Chemical Week

April 3, 1954

Price 35 cents

Now chemical labor unions are using new bait to catch higher wages . . . . . p. 14

Gelvatex' Beggs: He bucks "ranch-style" trend, builds gravity-flow paint plant . . . . . p. 32

Close to water, cheaper shipping; that's what's behind Hooker's Midwest plant site choice . p. 42

Plastic pipe bids for $19-million market in chemical plants; trump suit: corrosion resistance . . p. 52

New polyethylene is tougher to melt, harder to crack; it's cross-linked by cathode rays . . . p. 69

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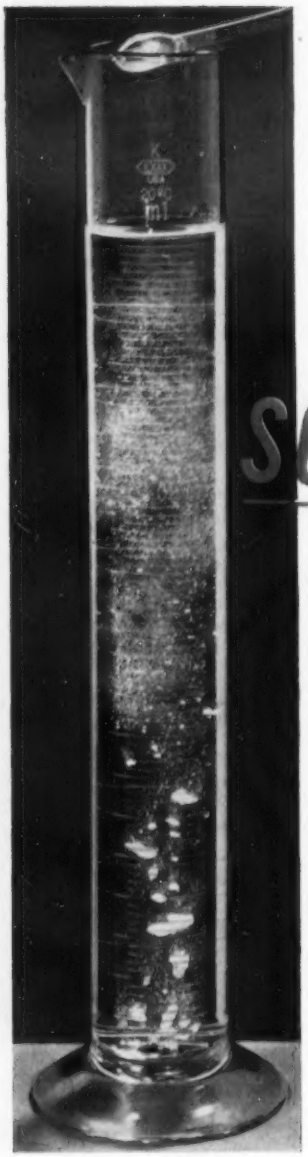

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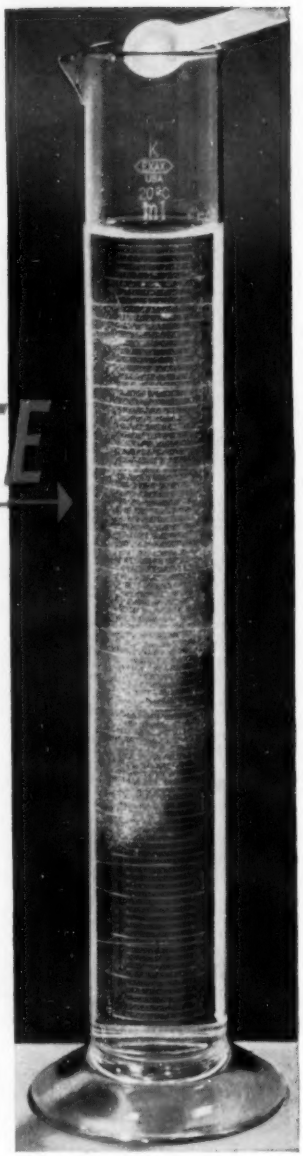

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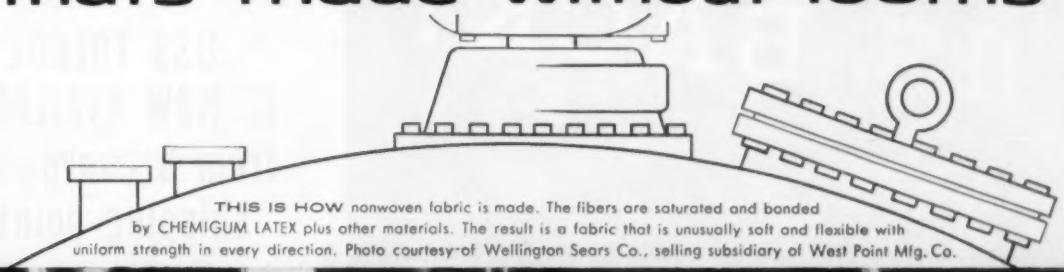
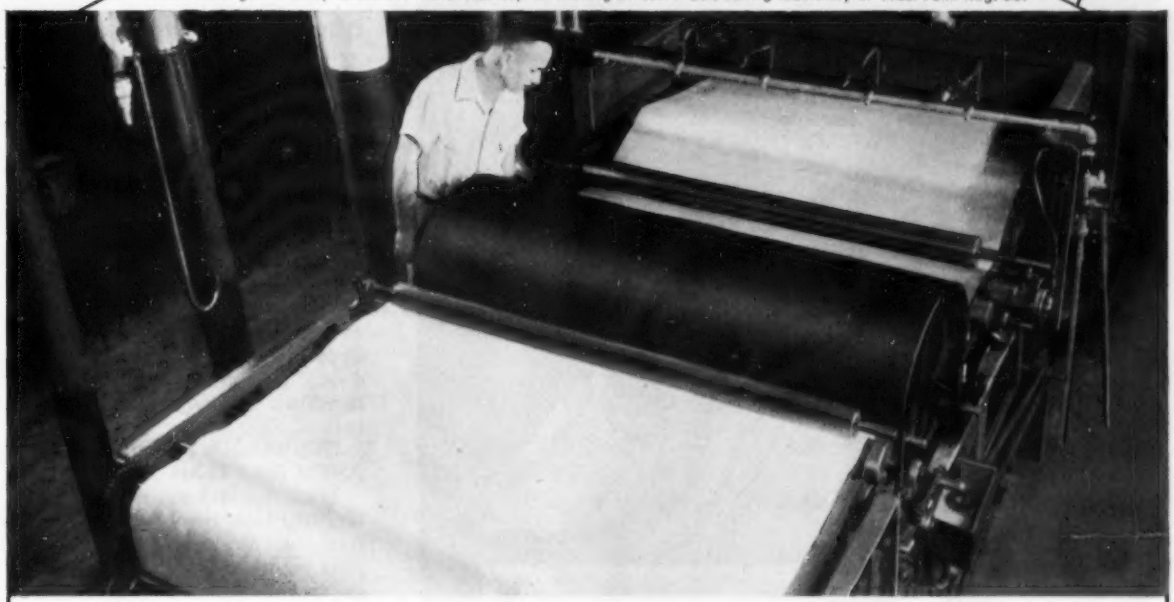


THIS IS HOW nonwoven fabric is made. The fibers are saturated and bonded by CHEMIGUM LATEX plus other materials. The result is a fabric that is unusually soft and flexible with uniform strength in every direction. Photo courtesy of Wellington Sears Co., selling subsidiary of West Point Mfg. Co.



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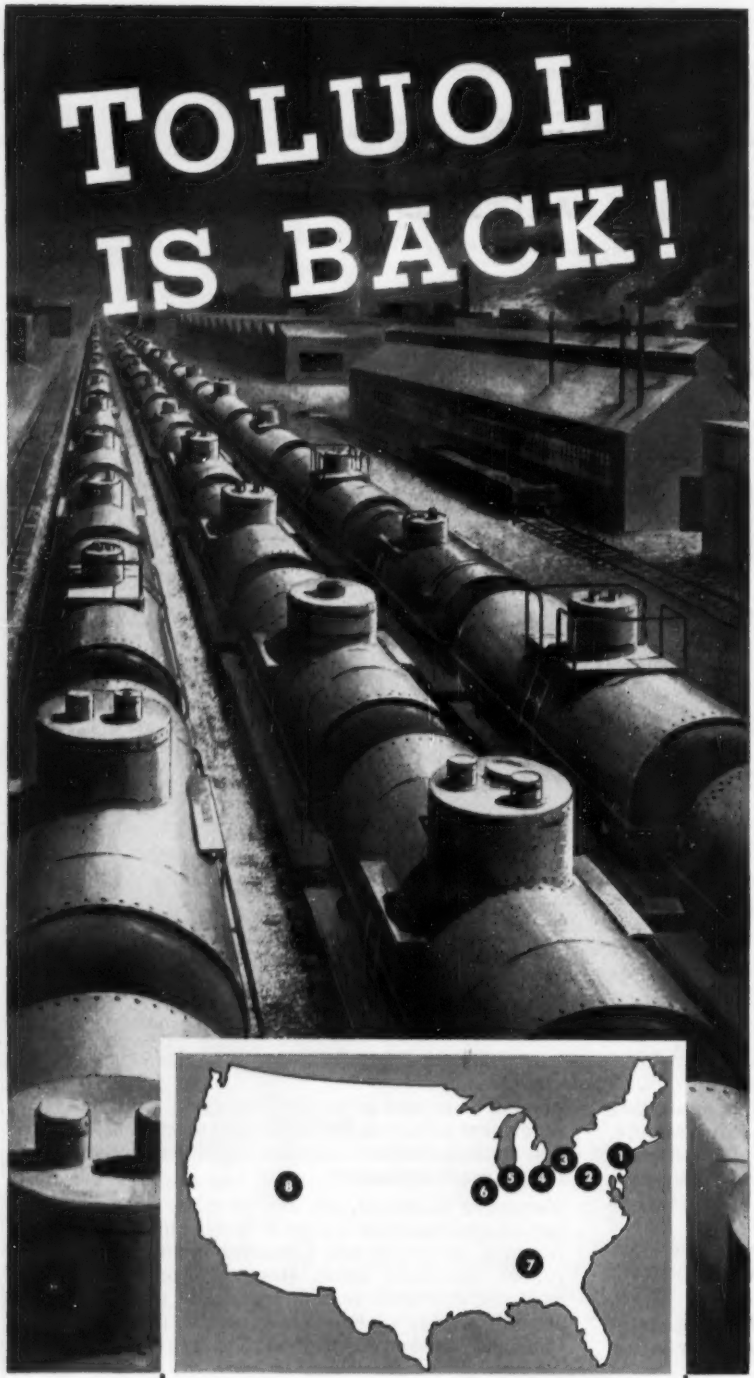

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Chemical Week

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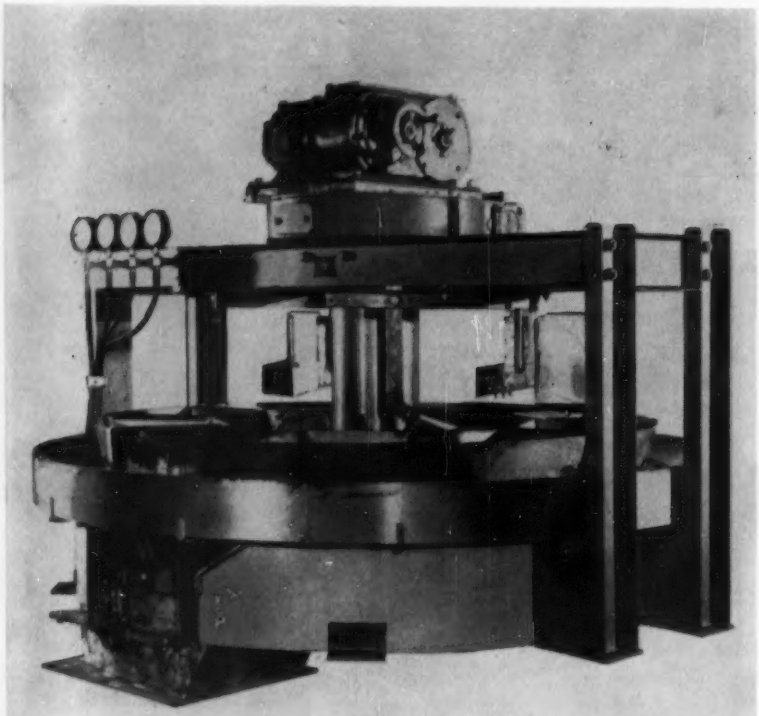

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OPINION. . . .

Ethylene Analysis

To THE EDITOR: You are again to be congratulated, this time for the fine work on "Ethylene—Prolific Precursor" (*Feb. 20*) . . . Those of us who have had occasion to be a part of similar end use studies can fully realize the time and effort expended on this analysis. The article will serve as a valuable reference to everyone interested in ethylene as a raw material and chemical building block . . .

Periodical reviews of the major chemical and petrochemical raw materials are extremely helpful aids to long-range planning. Here's hoping we continue to see them appearing in CW.

JOHN W. HUTCHESON
The Texas Company
Beacon, N.Y.

Corporate Engineering

To THE EDITOR: I appreciate your publishing my letter (*Mar. 20*) and citing some of the reasons we have advanced in favor of the Carlino-Milmoe bill . . .

The highlights note the principal points, but in paraphrasing instead of quoting one difference occurs. We would not be prevented from adding to our staff men skilled in administration even though they are not also professional engineers. Rather, we would be stopped from adding to our partnership men completely qualified in the fields of administration, finance, and personnel, unless they chanced both to be professional engineers and in some or most cases also financially able to contribute to the working capital of the firm . . .

D. J. WALSH, JR.
Partner
Sanderson & Porter
New York

We have, of course, reported on the Carlino-Milmoe bill—which would permit the practice of engineering by corporations in New York state—on several occasions. Both the pro and con views have been presented.

It is extraordinarily unfortunate, in our opinion, that the bill—which was

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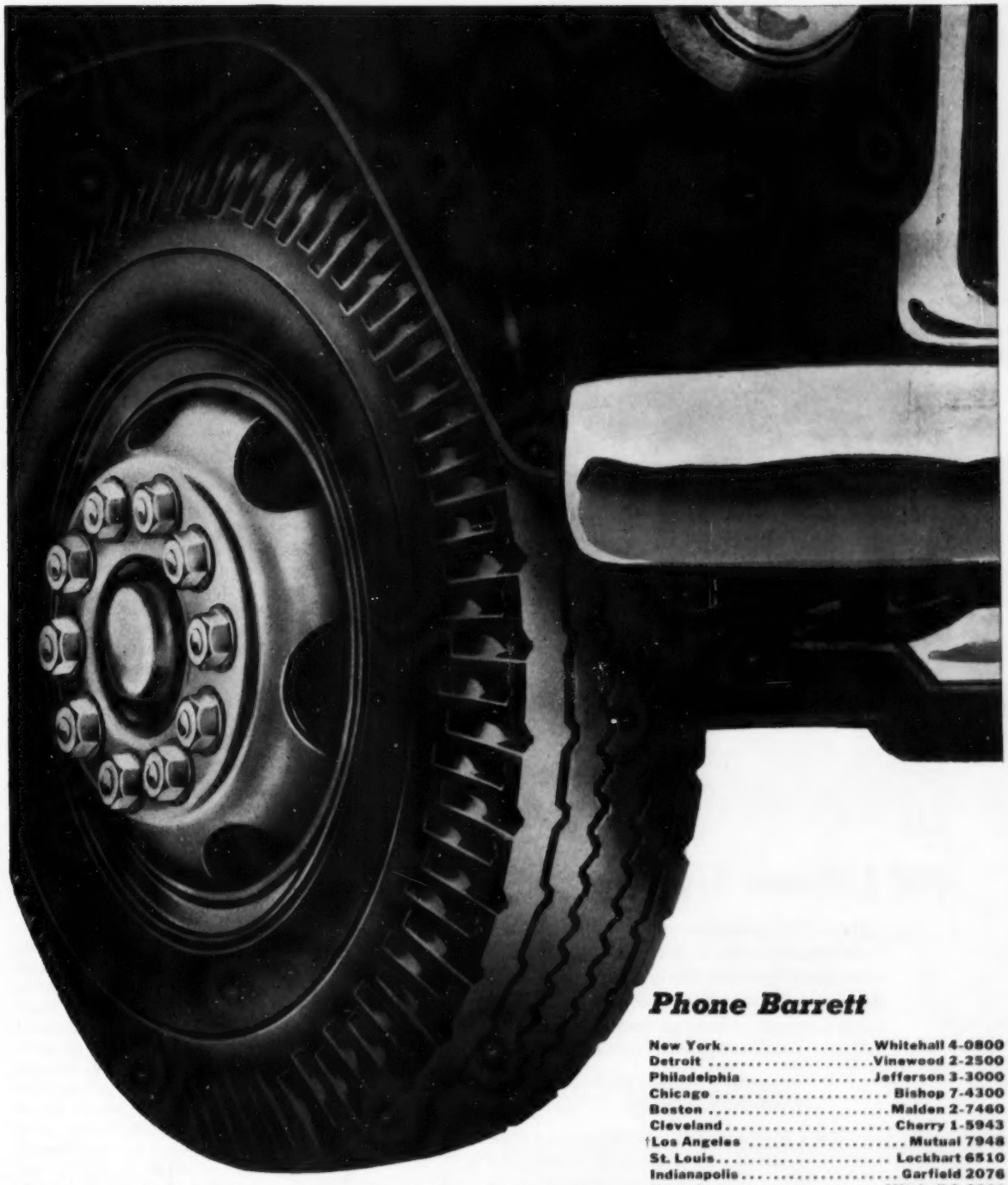
Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N. Y.



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reported favorably out of the State Senate Public Education Committee on Mar. 19—did not, for political reasons, reach the floor of the Senate.

It is, we believe, anachronistic and illogical to have legislation as now obtains—and which circumscribes the activities of competent engineering firms—remain unamended.

One of the main arguments against passage of the new bill is that the dignity of the profession of engineering would be affected. This savors of pseudo-logic: medical men are employed by incorporated hospitals without loss of dignity; professors are employed by incorporated colleges with their dignity unimpaired.

Professional engineers, one would think, would not suffer if corporations were permitted to practice engineering. Dignity cannot be legislated into a profession.

Engineering should, naturally, be done by engineers. But a corporate setup to further the practice of engineering does not militate against that. It merely permits the utilization of the advantages of corporate organization advantages that virtually all other businesses capitalize upon.—ED.

Fireworks Laws

TO THE EDITOR: This is with reference to the question of fireworks legislation and specifically to the letter of Mr. Vreeland of Hummel Chemical Co. (*March 13*). The weakness and danger of the bills advocated by Mr. Vreeland (S.1722-H.R.4651) are three in number, as we see it, and all of them quite serious:

(1) The provisions of the bills do nothing to make more effective existing state laws designed to prohibit the use of fireworks within a given state. In fact, the provisions of S.1722 would tend to make the existing situation even more confusing since its passage and implementation by the Interstate Commerce Commission would create another set of standards for the guidance of industry and the consumer.

(2) The provisions of S.1722 express a federal interest with respect to establishing standards which have traditionally been the function of the several states. In effect, too, the passage of this measure could very well make negative existing provisions of state law pertaining to fireworks.

(3) The competence of the ICC in matters of safe transportation of hazardous commodities cannot reasonably be extended or translated into the use of such commodities. No problem exists relative to the safety in transit of fireworks and it will be appreciated

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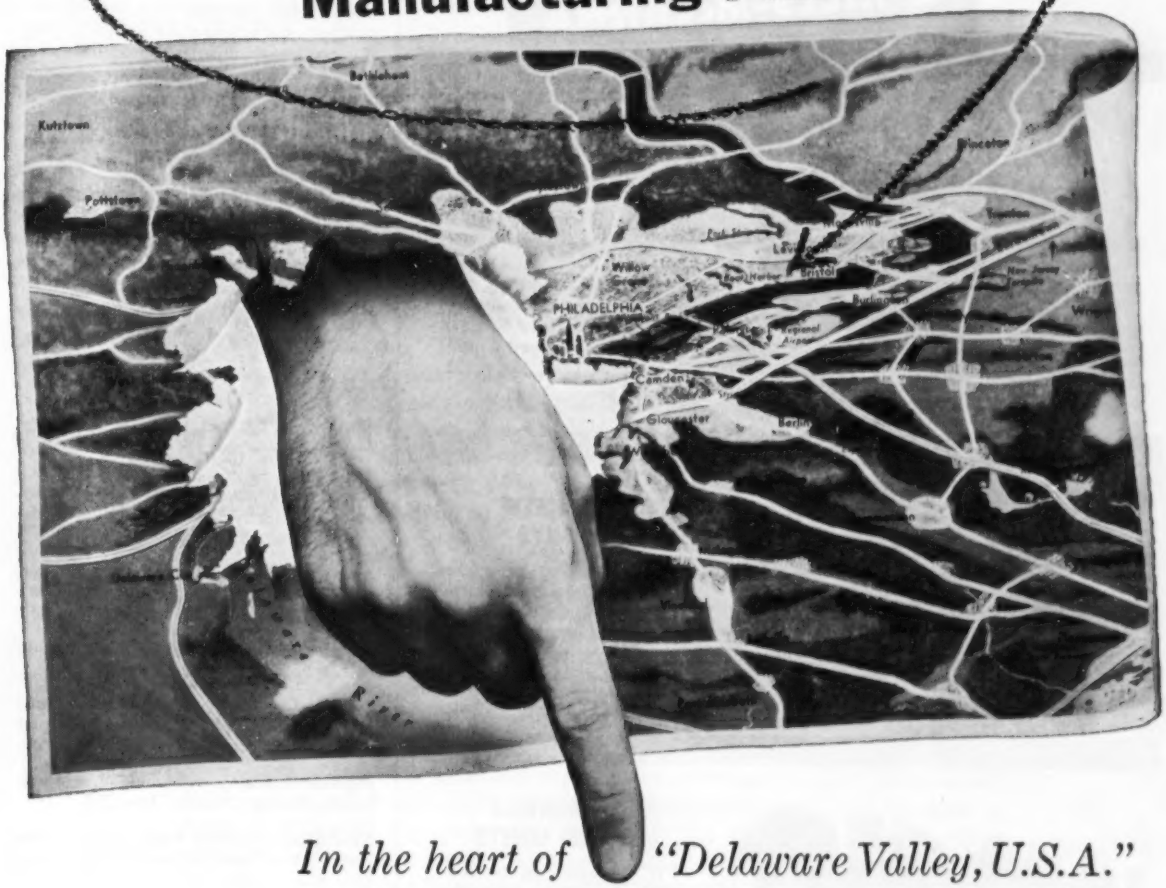

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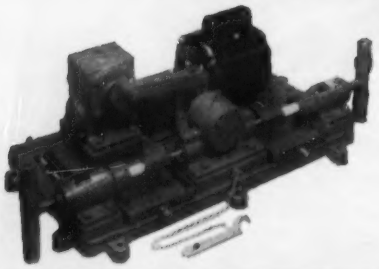

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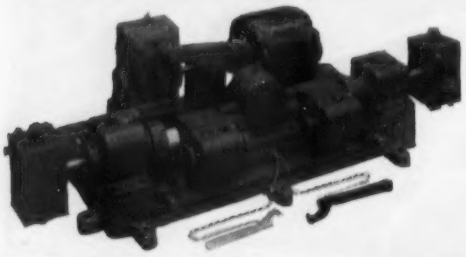

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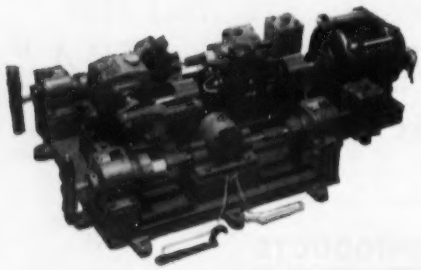

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OPINION . . . . . .

that almost any hazardous commodity may be so packed and otherwise safeguarded as to make its transportation reasonably safe, yet such commodities may be totally unsafe after delivery into the hands of children.

On the other hand, the virtues of the other bill now before the Senate, (namely S.2445-H.R.116) apart from the personal injuries to children it would prevent, are:

(1) It would make more effective existing state laws designed to safeguard the public by control of fireworks sale and use;

(2) It confines its provisions to the movement of articles in interstate commerce, a function for which the ICC was created and is well equipped to handle.

CHARLES S. MORGAN
National Fire Protection Assn.
Boston, Mass.

DATES AHEAD . .

National Farm Chemurgic Council, Inc., annual conference, Peabody hotel, Memphis, Tenn., April 5-7.

American Oil Chemists' Society, annual meeting, Plaza hotel, San Antonio, Tex., April 12-14.

American Zinc Institute, annual meeting, Statler hotel, St. Louis, April 20-21.

Assn. of Consulting Chemists and Chemical Engineers, symposium and banquet Belmont Plaza hotel, New York, April 27.

Electrochemical Society, annual meeting, LaSalle hotel, Chicago, May 2-6 .

Air-Pollution Control Assn., annual meeting, Patten hotel, Chattanooga, Tenn., May 3-5.

Forest Products Research Society, national meeting, Grand Rapids, Mich., May 5-7.

Chlorine Institute, spring meeting, Seaview Country Club, Absecon, N.J., May 11-12.

American Institute of Chemists, annual meeting, Hotel Berkeley-Carteret, Asbury Park, N.J., May 12-14.

Flavoring Extract Manufacturers' Assn., annual convention, Biltmore hotel, New York, May 16-19.

American Institute of Chemical Engineers, spring national meeting, Kimball hotel, Springfield, Mass., May 16-19.

Chemical Specialties Manufacturers' Assn., midyear meeting, Netherlands Plaza hotel, Cincinnati, May 23-25.

Manufacturing Chemists Assn., annual meeting and joint outing with SOCMA, Greenbrier hotel, White Sulphur Springs, W.Va., June 3-5.

Chemical Week
BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

Victims of the Texas City ammonium nitrate explosion seven years ago may be paid damages by the government despite the U.S. Supreme Court ruling that the government couldn't be held responsible under the tort claims act. The House Judiciary Committee has now recommended that such claims be paid. They total $200 million, but the committee estimates that $60-100 million would be awarded.

The Supreme Court threw out the test case on this point: the fertilizer shipment program was not the kind of activity that's covered by the tort law, which allows the government to be sued in the courts as an individual may be, except when an agency or employee is carrying out "discretionary functions." The appeals court felt that ordering shipment of the nitrate fertilizer for war relief purposes was such a function.

Almost simultaneously with the filing of the report, Congressman Clark Thompson (whose district includes Texas City) introduced a bill (H.R. 8528) that embodies virtually word for word the committee recommendations. This bill, with a few minor amendments, will likely be reported favorably by the Judiciary Committee—since it made the payment recommendation—and has some chance of House passage. Likelihood of Senate action is less. Too, as with many private bills, the bill's fate may rest on whether it is signed or vetoed by the President.

•

By-products are the cost-cutting gimmick that Crane Co. (Cramet) will exploit in its latest titanium venture. This week the company secured rights to several mineral deposits on which it will spend some $40 million between now and 1956.

The scheme: mine and separate the components, the ilmenite and rutile going, of course, into titanium production; zircon will be used to make a patented zirconium tanning agent for which the company has secured a license; monazite will be separated into its rare-earth components by means of a process developed by a Pechiney subsidiary, Societe de Terres Rares, and the thorium thus obtained will be sold to the government. The firm will separate, purify and aggressively market the other rare-earth components.

The rare-earths angle is the big news. If Crane can develop broad, profitable markets for these, the cost of producing titanium will be correspondingly less. (For more news on titanium, see page 68.)

•

Electric power from the atom got a forceful boost from the Atomic Energy Commission: three new starts on power reactors. A $17-million "boiling water" reactor is to be developed by Argonne National Laboratories, possibly with private utility help. A $10-million sodium-graphite reactor is to be built by North American Aviation, with the company picking up $2.5 million of the tab. Already in the mill is a $3-million "package" reactor to be built for the Army Corps of Engineers by the lowest industrial bidder.

•

New life for Carthage Hydrocal: Stanolind Oil and Gas and the Reconstruction Finance Corp. early this week were dotting and crossing

the final "i's" and "t's" of an agreement by which Stanolind will take over Carthage's Brownsville, Tex., plant. As part of the agreement, Stanolind will assume all of the $17.7-million load to Carthage from the RFC. Several months ago, Stanolind proposed to take over the plant and the debt—if all stockholders in Carthage would turn over to it their stock interests.

Stanolind will put another $20 million of its own money into the Fischer-Tropsch synthesis plant. If it can make the process work, look for some competitively wrought changes in the chemical solvents picture.

•

The National Science Foundation—which got a boost from President Eisenhower (CW Newsletter, March 27)—got a slap from Congress late last week.

The Foundation was allocated $11 million by the House Appropriations Committee—$3 million below request. Current-year spending is at an $8-million level; the increase to $11 million is contingent on a similar reduction in basic research support by the Defense Dept.

The Committee said it is very much interested in coordination of and elimination of duplication in scientific research among government agencies and private foundations, and would like to see the National Science Foundation have greater authority over activity in this field.

•

Who'll get new tax write-off certificates for ammonia under the increased expansion goal?

Following surveys of industry by the Business & Defense Services Administration, meetings of defense mobilizers with chemical industry men, and projections of demand by Agriculture Dept. personnel, it adds up this way:

ODM will approve certificates for roughly 200,000 tons per year of ammonia. But it already has on hand applications for some 500-600,000 tons. The task ahead will be to clarify the status of (1) ammonia certificates previously denied, (2) certificates applied for and still pending, and (3) new certificate applications that have come in since the 3.5-million-ton goal for fixed nitrogen was announced. Probably one or two new certificates will be issued on applications received up through early next week.

•

Meanwhile last week, Brea Chemicals, Inc., Brea, Calif., fired up the boilers of its new $13-million ammonia plant. Full capacity of 235 ton/day is expected by early June.

The ammonia plant is the first major manufacturing operation of the new Union Oil of Calif. subsidiary. But already under construction on the 30-acre site is a 70 ton/day carbon dioxide plant, and an engineering contract was awarded recently for a $2.5-million nitric acid and ammonium nitrate plant.

•

An easier climate for foreign trade—along the lines of the Randall commission report—was recommended to Congress this week by President Eisenhower. Among the proposals: three-year extension of reciprocal trade; tax relief on overseas profits; further government guarantees of overseas investments; customs simplification; revised antidumping procedures.

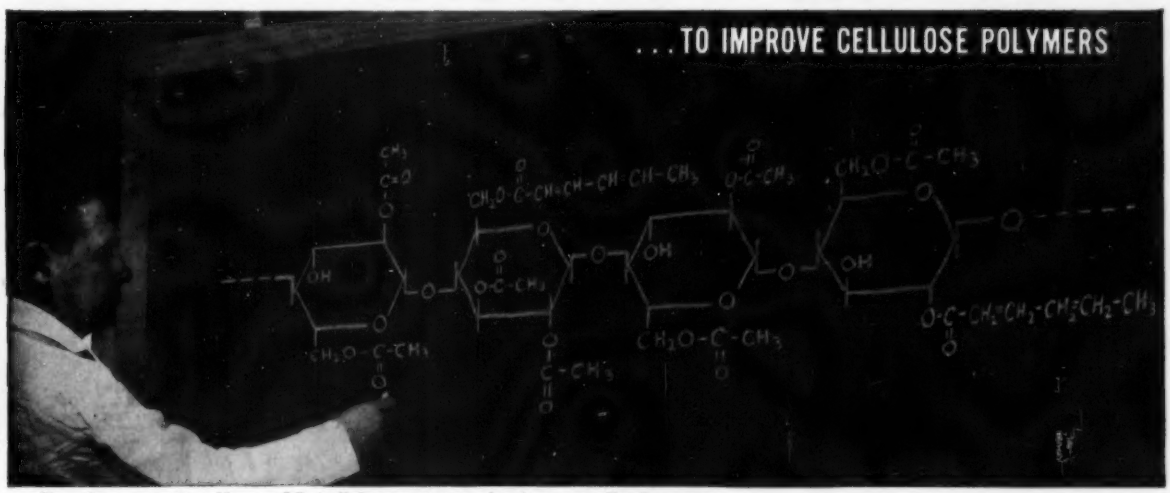
Proponents of this kind of legislation won't bet on victory, but they see a better chance of it now than a few weeks ago.

. . . The Editors

A new Hercules plant under construction at Burlington, New Jersey, will make the essential raw material for Canadian production of 'Terylene'—polyester yarn. Known as dimethyl terepthalate, or DMT, this basic chemical for polyester fibers will be made by an entirely new process, and will be available eventually for plastics and other uses.

HOW HERCULES HELPS...

Hercules' business today helps almost everyone's business. It embraces the production of synthetic resins, cellulose products, chemical cotton, terpene chemicals, rosin and rosin derivatives, chlorinated products, and many other chemical processing materials—as well as explosives. Through close cooperative research with its customers, Hercules has helped improve the processing or performance of many industrial and consumer products. If you are a manufacturer, we welcome the opportunity to work with you.



Hercules now offers Hercose®S (cellulose acetate sorbate), a new film-former. Widely soluble, it can be applied as tough, flexible coatings and cured to insoluble condition. Hercose S films have excellent resistance to heat and low temperatures. It is another in the diverse group of Hercules cellulose chemicals offered many industries. Write for details.

954-3

HERCULES

HERCULES POWDER COMPANY 992 Market Street, Wilmington 99, Del.

Chemical Packaging Problem Solved by Inland Lining Research

Problem

New Salt-Free Sulfonated Detergents
BIG MARKET—NO PACKAGE!

NINOL LABORATORIES, CHICAGO, recently created the Ninex—300 Series—of alkylaryl sulfonates. These new *salt-free* sulfonated detergents offered many advantages to manufacturers of dishwashing liquids, shampoos, etc. A wide market was waiting but economical packaging was one of Ninol's biggest problems. Steel reacted with the product to form iron salts . . . glass was too expensive. Ninol tossed the problem to Inland . . . and here's how it was licked:

EXPERIENCE

Inland chemists analyzed Ninex—300— . . . drew on long experience to recommend types of linings that had best chance of keeping product salt free.

+ RESEARCH

Would a standard lining do the job—or would a new one have to be developed? Inland's chemical container experts tested dozens of linings to find out.

+ QUALITY CONTROL

Lining that passed lab tests was tried under actual packaging conditions.

= PROTECTION-EERED CONTAINERS

A successful lining was found and Ninex—300—goes to market, pure and salt-free, in specially lined 55 gallon drums. Inland's constant research and quality control throughout production make sure Ninol's containers continue to provide safest shipping.

Let Inland's formula for protection-eered containers help solve your problems, too. Write today . . . no obligation.

INLAND

Chemical Division, Dept. A

INLAND STEEL CONTAINER COMPANY

Division of INLAND STEEL COMPANY

6532 South Menard Avenue · Chicago 38, Illinois

BUSINESS & INDUSTRY. . . .

Staggered Sales

Early returns on first quarter sales for '54 in the chemical industry are puzzling the economic prognosticators. By this week, plastics and organic manufacturers say their sales have declined compared with first-quarter 1953 figures, but they're predicting over-all yearly gains in both sales and net profits. Pharmaceutical producers, on the other hand, are being clocked at a pace significantly ahead of 1953 schedules, yet vouch that "year-end sales won't exceed 1953 figures . . . noticeably."

Some hitch the mingled returns to "unusual features in today's chemical picture—mainly prices and taxes." Despite the present inventory correction, prices in the chemical industry have remained relatively stable, excess profits tax's elimination is cushioning nets, accelerated depreciation allowances are reaching a peak. But not every company in the industry is being affected by the stabilizing factors at the same time. Result: uneven earnings.

A few typical examples of the variance in sales activity:

• The decline in business that began last summer for Monsanto Chemical Co. is still continuing, says Daniel Sheehan, vice-president. Sales in the organic and plastics divisions are trailing last year's records, while inorganic sales continue to produce gains. "But the turn upward is expected in May or June—and for the full year of 1954, sales should be greater than the $340.6 million of 1953."

• Hercules Powder's sales are running 7% below 1953 in physical volume, but earnings will be up, company officials say. "Reason: elimination of excess profits tax."

• Dewey & Almy's sales for the first two months of the current year have pushed 20% ahead of sales a year ago. "Earnings," says Hugh Ferguson, president, "will be materially better than the 16¢ a share earned in the like 1953 period, but by year's end the trend may reverse itself."

• Foote Mineral—typical of the lithium chemical producers—is boasting sales and earnings "substantially above the level maintained for the past few years—due largely to production from new units now in production at Kings Mountain, N.C., and Sunbright, Va."

SHEEHAN: "Organic, plastic sales lagging . . . "

• Allied Chemical's earnings for the first quarter this year "will be virtually unchanged over 1953."

An over-all view of first-quarter sales points up an almost equal division of losers and gainers; more of the larger companies seem to be on the slightly depressed side; smaller companies, especially those with new facilities now in operation, are reporting the biggest gains.

Din Over Depletion

Perennial foes of the federal "depletion allowance"—a tax deduction device that bears on production and prices of numerous chemicals and petrochemicals—are renewing their attacks this week, though it's unlikely they'll change Congress' mind.

Latest fuel for the wrath of this anti-depletion-allowance clique: figures just published by a Congressional committee showing for the first time what this allowance means to four major oil companies. In 1952, depletion allowances brought these tax savings: Humble Oil & Refining, $88.5 million; Socony-Vacuum Oil, $45.1 million; Standard Oil (Calif.), $60.9 million; and Phillips Petroleum, $33 million.

For oil companies, depletion allowance is taken as 27½% of gross income. Other rates: sulfur, 23%; phosphate rock, trona, potash and fluorspar, 15%; coal and brine, 5%. Intent of this provision of the internal revenue code is to enable such companies to recover the cost of exploration and development. Obviously, the allowance is a big saving to these firms, encourages high production, permits somewhat lower prices.

Sen. John Williams (R., Del.) and other long-time enemies of the depletion allowance attack it on two grounds: they charge it cuts the amount of taxes the companies should pay; and they contend that it gives integrated companies an unfair advantage over competitors.

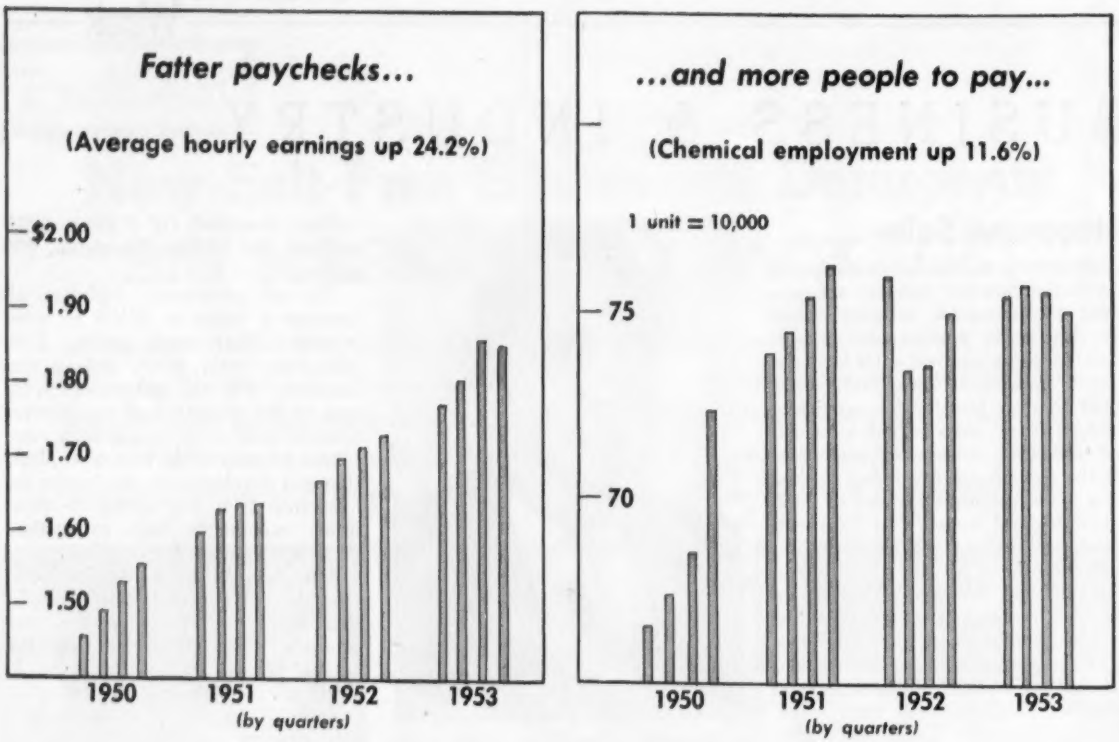
Cascading Socialism

Niagara Falls power, if further developed by the government, may result in control of all power facilities in the area by the government. So charge 10 large chemical process firms doing business on the Niagara Frontier.

The 10 companies, which want private development of the $400-million Niagara power project, are: Carborundum Co., General Abrasive Co., Great Lakes Carbon Corp., Hooker Electrochemical Co., International Minerals & Chemical Corp., International Paper Co., Kimberly-Clark Corp., Mathieson Chemical Corp., Niagara Alkali Co. and Stauffer Chemical Co.

They are urging upon the Senate Public Works Committee in Washington passage of the Capehart-Martin-Miller-Dondero bill. It provides for development of Niagara power by private enterprise.

"If the government should undertake the Niagara redevelopment project," the companies declare, "the experience of other electric utilities in certain areas where public power developments have occurred indicates a probability that the present facilities of Niagara Mohawk at Niagara would also be taken over by a public agency."



The Panacea They Pine For

When a patient is convinced that the most pleasant possible remedy is also the most effective, his enthusiasm for that treatment knows no bounds.

Such is the situation on the labor-management front this week, with the labor unions stridently asserting that the quick, sure way to ward off recession or depression is to create more purchasing power by raising wage rates. In the chemical process industries, the pattern for 1954 seems to be an increase of about 6¢/hour.

Chemical Policy Set: This is the trend that the chemical labor unions will strive to uphold throughout the rest of this year. All three of the major chemical unions are demonstrating—in word and in deed—that they are heartily in accord with the economic diagnosis and prescription made by AFL's George Meany, CIO's Walter Reuther, and the United Mine Workers' John L. Lewis. At regional conferences, at training schools, and in their publications, the chemical unions are telling their members that wage increases are to be sought out of patriotic as well as economic motives.

It's to be noted that this will require a shift in the unions' line of reasoning: during the industrial boom that came during the Korean War, the unions argued for a higher wage on the ground that industry could easily afford it; now, say union spokesmen, industry can't afford not to keep boosting consumption.

Buying Power Sought: Feeling that the higher unemployment figures constitute a challenge that they don't dare ignore, and observing that industrial production has declined from its early 1953 peak, the union leaders are pinning the blame on low consumption.

"Developments in recent months," says Meany, "have made it clear that the country's ability to produce is becoming greater than its ability to purchase and consume."

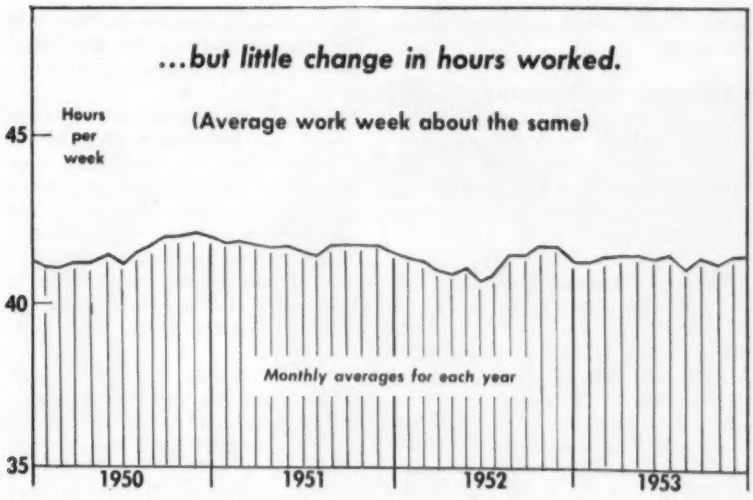
Hence, he reasons, the logical thing to do is increase consumer purchasing power. Backing Meany up on this point, the AFL's executive board contends: "Expanding buying power of workers is necessary to support expanding production and trade and to advance living standards."

Shorter Week Spurned: Higher wages also were recommended in the 10-point "prosperity program" put forward last week by the CIO's executive board. Reuther, interviewed after the special board meeting in New York, said he's opposed to cutting the workweek down to 30 hours in order to spread work among more wage-earners. That, he declared, would simply be "sharing the scarcity" of employment; what the country really needs, he insists, is more purchasing power.

One CIO union has nominated itself to spearhead the wage drive through the coming months. Meeting at Cleveland, the United Rubber Workers' 200-man international policy committee has decided on a 1954 economic platform calling for a "substantial" wage increase and a guaranteed annual wage program.

After URW Pres. L. S. Buckmaster reported that the 1953 economic program netted 120,000 workers an aggregate of nearly $29 million in higher wages and fringe benefits, the union's policy group proclaimed:

- "The experience of 1953 reveals that the current purchasing power of the citizens of the U.S. and Canada cannot absorb all the goods and services they are able to produce with a resulting increase in unemployment;"
- "The reduction in weekly hours has resulted in a loss of take-home pay;" and
- "Our growing labor force and technological advances make it imperative that consumer purchasing



power be constantly expanded."

Seven-cent Average: Among chemical unions, the United Gas, Coke & Chemical Workers (CIO) would appear to have the best record on wage increases so far this year; the 12 Gas-Coke contract renewals included in CW's summary carry wage increases averaging nearly 7.6¢/hour and ranging up to 28¢ for a few members. Latest of these came at the middle of last week at the Lever Bros. plant in Hammond, Ind., where pay rates of about 1,000 Gas-Coke members will be boosted by 6¢/hour.

For U.S. locals of International Chemical Workers Union (AFL), 1954 wage increases have ranged from 2¢/hour (at a Florida fertilizer plant) to 8¾¢/hour (at a New Jersey cellulose plant). In Canada, the ICWU local at the Canadian Industries Ltd. plant in Calgary, Alberta, has been granted wage boosts of 6¢ to 10¢/hour, pushing base rates up to $1.46 and $1.98/hour for unskilled and skilled workers, respectively.

Pattern for '54

(Wage increases granted at 26 chemical plants since Jan. 1)

Amount of Increase	Number of Plants
0¢	1
1- 3¢/hour	3
4- 6¢/hour	8
7- 9¢/hour	9
10-12¢/hour	4
13-15¢/hour	1

One local of UMW District 50 has agreed to forego a wage increase this year; others are signing up for rises of 5¢ to 7¢/hour. In some cases, the new contracts also provide for freezing old cost-of-living bonus rates into base pay.

Also eager to do their part in combating recession by accepting higher wages are the contract construction workers employed at chemical expansion projects. At Paducah, Ky., the AFL Ironworkers signed up for 10¢ and 12½¢ hourly increases retroactive back to Jan. '53.

Specific arguments expected to be used by chemical union negotiators this spring and summer: ending of the excess profits tax will swell the companies' net profits; productivity is increasing through use of new plants and equipment; loss of overtime is cutting wage-earners' take-home pay.

Companies' counter arguments: increasing competition from foreign and domestic rivals; expansion of production capacity has put supply ahead of demand in many cases; and the consequent need for frugality in operating on a narrower profit margin.

But in reply to labor's contention that industry must raise wages to step up purchasing power, the chemical industry can answer that it has already accomplished a lot along that line. The charts on these pages show that chemical companies have taken on many new employees, increased pay rates (more than in most other industries), and all the while kept a full workweek. Since 1950, the chemical industry has raised its contribution to public purchasing power by more than 43%.

St. Louis Blue Chip

Long tightly held, Mallinckrodt Chemical Works entered the open market last week, for the first time in its 86 years, issued 75,000 shares of nonvoting common stock. With a par value of $10, the shares sold for $26.50 each. Charlton MacVeagh, Mallinckrodt's treasurer and vice-chairman of the board, arranged the financing through St. Louis bankers.

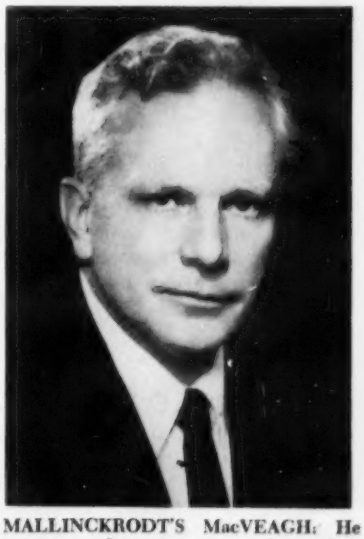
With the $1,987,500 it gets from this issue, Mallinckrodt will intensify research, improve its processes and continue its plant expansion, chiefly at St. Louis.

Financial Structure: The company, founded in 1867 by the brothers Gustav, Edward and Otto Mallinckrodt and incorporated in 1882, has always been tightly held. Before the issue of the new common, Edward Mallinckrodt, Jr., who succeeded his father as chairman of the board in 1928, owned 91.48% of all outstanding common stock. In addition, he owned 322 of the 5,822 shares of 6% cumulative preferred outstanding, and the Edward Mallinckrodt, Jr., Foundation owned the remaining 5,500 shares.

Of the 360,000 shares of nonvoting common authorized, the new issue of 75,000 brings to 255,000 the shares currently outstanding. Also authorized: 240,000 shares of voting common, of which 120,000 are outstanding.

As long-term debt, Mallinckrodt still owes $4,750,000 on a 3 3/8% note for $5 million held by Prudential Insurance Co., due April, 1971.

Product Spectrum: From 125 raw materials, some as exotic as gallnuts



MALLINCKRODT'S MacVEAGH: He arranges a first venture into the market.

and opium, Mallinckrodt turns out an avalanche of 1,500 products for its 9,000 customers. (The five largest customers accounted for 14.5% of commercial sales in 1953.) Pharmaceutical chemicals are Mallinckrodt's mainstay; it produces narcotics, ether, phenobarbital, theophylline, barium sulfate, soda lime, cyclopropane, magnesium trisilicate, bismuth salts, iodides, citrates and mercurials.

Net sales have climbed from $21,998,000 in postwar 1946 to a thumping $36,207,000 last year. Of Mallinckrodt's total sales in 1953, 52.3% came from products it manufactured, 26.0% from resale of chemicals and 21.7% from AEC for producing high-purity uranium oxide, uranium tetrafluoride and uranium metal. Sales of its Canadian subsidiary, Mallinckrodt Chemical Works Ltd., wholly owned since 1947, were $1,383,000 in 1953.

Intensified Research: Bracing for increased competition from U.S. rivals and foreign producers of fine chemicals, Mallinckrodt has jumped its outlay for research and development from $585,927 in '51 to $812,389 in '52 and to $1,140,586 in '53. Laboratory space has been expanded 75%.

Since 1946, net additions to its plants and equipment have cost Mallinckrodts $6,811,654.

COMPANIES. . . .

Dow Chemical Co. has acquired control of the Columbia Oil Shale & Refining Co., which owns some 8,640 acres of shale oil lands in western Colorado, through purchase of a majority share of Columbia's stock. Reliable reports set the transaction at $1.5 million, with "substantial royalty fees."

•

Late 1953 earnings reports:

- Heyden Chemical Corp.'s sales rose 5.4% (to $23.4 million); net (after taxes) inched up 3.0%—to $1.2 million.
- The Borden Co.'s sales rose 3.1% (to $792 million), net jumped 14.7% (to $20.2 million), the Chemical Div. receiving credit for the lion's share of the gain.
- American Potash & Chemical Corp.'s sales climbed 24.4% (to $22.4 million), net was up 26.7% to $2.1 million.

EXPANSION. . . .

Chromium: The Electro Metallurgical Co., a division of Union Carbide and Carbon Corp., has started commercial production of electrolytic chromium at its Marietta, O., plant. Principal markets: jet-engine producers, gas-turbine and rocket-propellant manufacturers.

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Cellophane: Olin Industries, Inc. will build a cellophane plant at Kern, Ind., calculated to double the company's output of cellophane. Design, construction work will be handled by Du Pont Co., Wilmington, is due to be started soon.

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Phenol, Acetone: Standard Oil Company of Calif. has started production of phenol and acetone at its Richmond, Calif., refinery at a rate of 35 million lbs./year of phenol, 20 million lbs. of acetone. Designed to operate on cumene feedstock produced from propylene and benzene at Standard's El Segundo refinery, the plant is the first in the U. S. to use the synthesis process licensed by the Hercules Powder Co., Wilmington.

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Resins: Rounding out Reichhold Chemicals, Inc.'s expansion plans at Azusa, Calif., is a polyester plant—construction of which was started early last month—and a $1-million research office building—planned to handle work on chemical plasticizers. Present facilities include production units for phenolic and urea bonding, laminating and impregnating resins.

•

Pulp: With construction virtually completed, the $46-million plant of the Ketchikan Pulp Co., Ketchikan, Alaska, is scheduled to enter production sometime this year. Touted as the largest privately financed project ever undertaken in Alaska, it's a joint venture of the Puget Sound Pulp & Timber Co., Bellingham, Wash., and American Viscose Corp., New York.

•

Record Expansion: Monsanto Chemical Co. will this year top its $26.8-million investment in new plants and facilities (made in 1953) with projects calculated to cost $41 million. Continuing as Monsanto's leading sales items: plastics and resins—which account for 14% of the company's sales.

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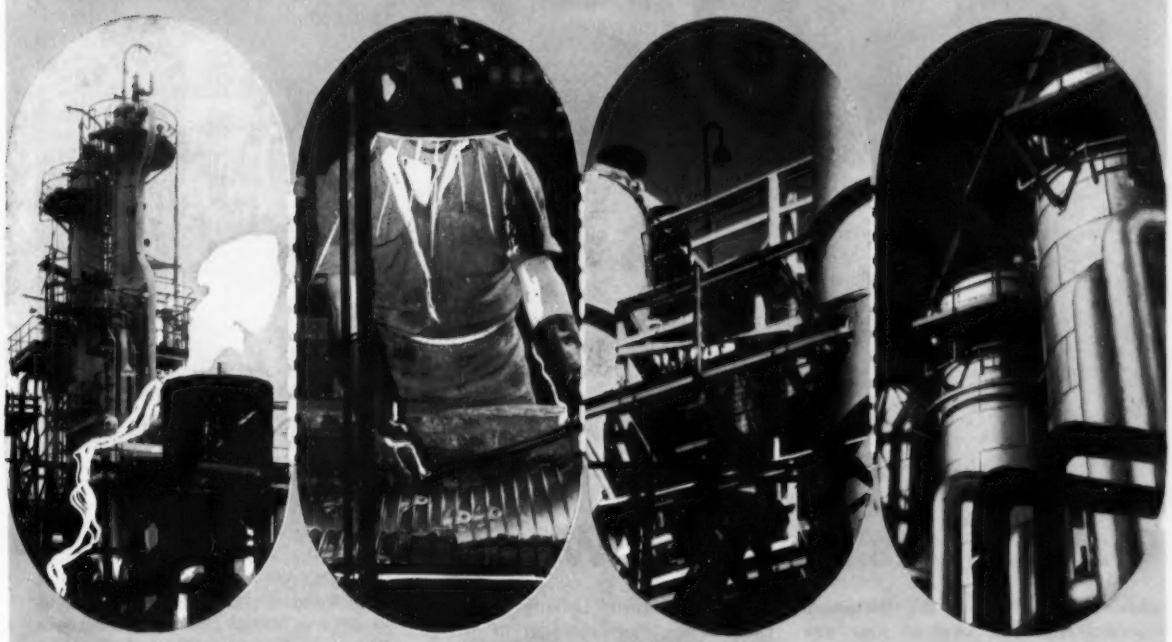
Plastics: Borg-Warner Corp. (through one of its subsidiaries, Marbon Corp., Gary, Ind.) has entered the plastic production field. Its first product: a multi-purpose resin, claimed to have high impact resistance, good temperature performance.

WIDE WORLD

Japs Land Radioactive Tuna

AFTERMATH of thermonuclear test explosion in the Bikini area, this large tuna is checked for radioactivity by Geiger counters. It's part of the catch of the fishing vessel *Fukuryu Maru*, which was showered with radioactive ash from the explosion. Part of the vessel's catch reached market, causing a sharp drop in prices, but officials in Tokyo, where the *Fukuryu Maru* docked, believe most of the catch has been recovered. The Bikini test, latest step in the development of a hydrogen bomb by the U.S., caused an explosion 600 times more powerful than the Hiroshima A bomb.

Stauffer Chemicals



for Industries

American Industries depend upon Stauffer for a large number of the heavy chemicals needed. With over 100 products on its list Stauffer furnishes such essentials as caustic soda and acids for every industry, carbon bisulphide for synthetic textiles, borax for glass and ceramics, sulphurs for rubber, perchlorethylene for dry cleaners.

Stauffer, represented in every state, is a company with a history of serving many industries with the vital raw materials. For the industries, large or small, which need heavy chemicals, Stauffer has the manufacturing facilities, 43 plants and warehouses coast-to-coast to keep pace.

Stauffer Products:

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Boric Acid
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Chlorine
Citric Acid
*Copperas**
Cream of Tartar
*Ferric Sulphate**
Fire Extinguisher Fluid
Insecticides and Fungicides
*Muriatic Acid**
*Nitric Acid**
Perchlorethylene
Potassium Nitrate
Rochelle Salt
Silicon Tetrachloride
Sodium Hydrosulphide
*Sodium Silico Fluoride**
Sulphuric Acid
Sulphur (processed) for all uses
Sulphur-Rubbermakers
Sulphur-Insoluble (in CS_2) (special-purpose rubber-making)
Sulphur Chlorides
Sulphuric Acid
*Superphosphate**
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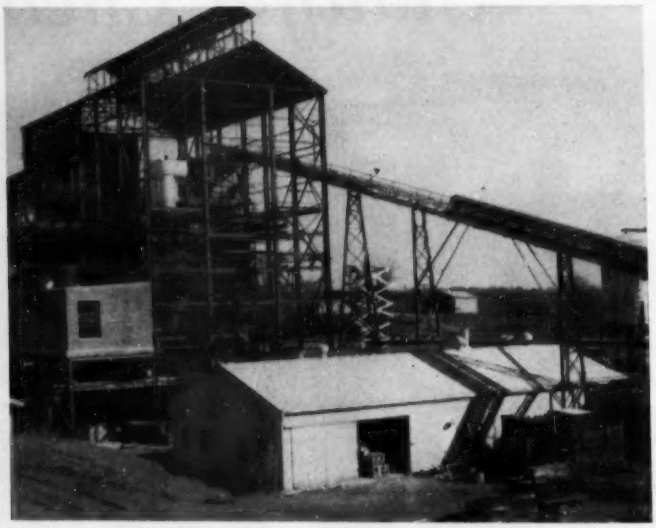


SHEA'S LUX: Need for a second furnace at Columbia (above, right) . . . a distinct possibility.

Getting Its Second Wind

Shea Chemical Corp.—the Baltimore concern that just over a year ago vaulted into fourth position among the nation's top phosphorus producers (CW, Feb. 7, '53)—is on the move again. Its latest expansion maneuver—the decision to build a phosphoric acid-sodium tripolyphosphate plant on the Ohio River at Jeffersonville, Ind., scarcely off the planning boards last week (CW Newsletter, March 27) before company executives revised their plans, upped output capacities 50%.

Back of the bold decision to invade the Ohio River Valley is a well-calculated expansion plan, quite in keeping with Shea's intention of "keeping away as much as possible from the production of superphosphates." Elemental phosphorus—from Shea's Columbia, Tenn., furnace—now going into dicalcium phosphate production will be gradually diverted to Jeffersonville for processing into 75,000 tons of phosphoric acid, 45,000 tons of sodium tripolyphosphate, 15,000 tons of sodium metaphosphates annually.

Obvious major consumers: detergent manufacturers in Cincinnati and Jeffersonville, customers up the Ohio as far as Pittsburgh, south as far as New Orleans. If the switch-over goes along as scheduled, 50-60% of Shea's 40-million-lb. elemental phosphorus capacity should be ticketed within the year for tripolyphosphate production, a completely new market area should be opened up for company products.

"That in turn," points out John Lux, Shea's vice-president in charge of research and industrial sales, "will undoubtedly trigger construction of a second phosphorus furnace at Columbia on the same scale as the company's 30,000-kw. installation now in operation."

Construction time, Lux estimates, can be chopped 25-30% . . . "in that Shea does its own engineering work." Phosphoric acids contracts are already being accepted for June delivery ("and the ground's not even broken at Jeffersonville yet"); production men estimate tripoly production can be started by September.

Shea's major competition in the Ohio River Valley, company spokesmen feel, will come from Virginia-Carolina Chemical Co., now building a 12-14,000-ton tripolyphosphate, 25,000-ton phosphoric acid plant at Cincinnati. "But they won't beat us in by much," promises Lux. "And from our preliminary market surveys, there's ample room for both of us to operate efficiently."

Also on the boards for future expansion: a drive on plasticizer, insecticide, lubricant markets.

Sales are still swelling. From $1 million in '50, total gross sales records at Shea last year climbed to over $6 million, should jump an additional 20% this year.

Construction activities at Shea still change on a day-to-day basis to cope with increasing demand, unexpected installation difficulties. "It's one big advantage the small chemical company has," points out Vincent Shea, president; "adjustability—the freedom to change your mind even when plans are on the design boards—enabled us to get our initial phosphorus furnace going in record-shattering time."

Where the company will move next is anybody's guess. Best bet: away from further immediate expansion into detergents—since company policy still eschews putting all its eggs in one basket. But that it will move soon is a virtual certainty, guaranteed by additional phosphorus capacity now under consideration.

Rocketing Ahead

Final returns on the output of the Italian chemical industry in 1953 place production levels at all-time highs—20% above 1952 records. Almost every sector of the industry recorded heavy gains; considerable credit for the rise is attributable to export of Italian-produced chemicals.

Leading the pack: production of synthetic ammonia—which jumped to 293,116 tons in '53 compared with 236,433 in '52; output of 62.2% sulfuric acid, which soared to 2.50 million tons in '53 as against 2.32 million tons in '52.

Production of caustic soda recovered somewhat—amounted to 181,210 tons against 135,508 in '52 and 273,999 tons in '51; organic dyestuffs inched upward to 10,400 tons compared with 10,125 tons in '52.

Italian producers, encouraged by their progress, predict even more spectacular gains this year "provided that the economic unrest in the U.S. doesn't set a worldwide recession in motion."

Boxing the Compass

North, south, east and west, hearings will be held this spring by a government task force to thrash out problems of water supply, pollution abatement and power generation—all vitally affecting the chemical process industries. The water resources and power task force of the new Hoover commission on government organization will hold public hearings May 3 at San Francisco, May 17 at Denver, June 1 at Chattanooga, and June 14 at New York.

Chemical spokesmen have been alerted by Charles D. Curran, administrator of the task force, that his office in Washington must be notified of their intention of participating in any one of the regional hearings. In addition, 45 copies of their proposed statements must be filed in Curran's office at least two weeks before the hearing. Replies are already trickling in.

Curran likewise has apprised governors of the 48 states, federal agencies and members of his task force of the hearings. Individuals or industry representatives also will be allowed to testify.

The task force on water resources and power comprises 13 engineers, 2 publishers, 3 former state governors and several business leaders. It includes Albert Chester Mattei, president of Industrial Research Laboratories, Ltd.

This group, seeking ways to streamline operations, trim costs, and eliminate activities that compete with private enterprise, will investigate functions of the federal government's executive branches dealing with all phases of water utilization and with the generation and distribution of electric power from hydro, steam, and other plants. Since adequate water and economic power are vital to its operations, and pollution abatement is one of its big problems, the chemical industry has an important stake in these upcoming hearings.

Triple Tax Threat

New tax burdens are in prospect for chemical process industries in Texas as a result of a threefold tax plan unfolded by Governor Allan Shivers to the special 30-day session of the legislature convened at Austin. A new gathering tax on natural gas, an increased beer tax, and a higher corporation franchise tax on Texas firms would bring in an additional $25.6 million annually if the legislators enact the measures proposed by Shivers.

In revenue, here's what the governor is asking for: (1) a gas gathering tax of ½¢ per 1,000 cu. ft. to replace the 1951 gathering tax outlawed by the U.S. Supreme Court; it would raise $14 million a year; (2) an increase in the tax on beer from $1.37 to $2 per barrel, providing an additional $3 million a year; and (3) an increase in the franchise tax paid by corporations doing business in Texas from $1.25 to a flat $2 per $1,000 of corporate assets, which would bring in $8.6 million a year in new revenue.

The $25.6 million a year in new taxes would be used to pay school teachers in Texas a wage boost of $402 per year and to increase the salaries of other state employees by $120 per year.

Representative Joe Kilgore of McAllen, Tex., who is spearheading the drive to put through the governor's tax program, introduced the gas gathering bill. Last week, hearings were under way on the natural gas tax, the beer tax and the corporation franchise tax.

While the gathering tax on natural gas was expected, the disturbingly high proposed increase in the corporate franchise tax came as a surprise. No more than a 25% increase had been anticipated.

If this tax on firms doing business in Texas is raised, it will affect about 30,000 corporations, including vast petrochemical enterprises. Thus makers of chemicals, as well as the natural gas industry, are gloomily awaiting the outcome of the special session at Austin.

Shell Calf-Scramble Winner Counted Out

SPONSORING CALVES at the annual Houston Fat Stock Show calf scramble is a popular community relations gesture for Texas chemical companies. Last year's winner (of the Shell-sponsored calf) Chick Carter is pictured (*left*) as he drags an Angus over the finish line, and (*right*) as he shows his prize—a Hereford at this year's show. If Carter's Hereford had won a prize, his owner would have won a college scholarship, but Dame Fortune ruled otherwise. Raised on pure ranch water, the Hereford, brought back to Houston for the show, wouldn't drink city-chlorinated water, lost 40 precious pounds. Disappointed Shell employees—an enthusiastic cheering section—are chanting, "Wait 'til next year."

LOCAL LABOR: Mining is done by 400 Africans, supervised by three Europeans.

Lucky Strike in Uganda

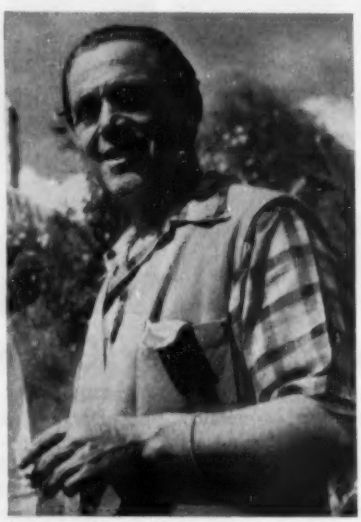
Tungsten—the element dear to the hearts of steel manufacturers—has brought fame and fortune to a miner (and former railway construction man) in East African Uganda. Polis Kikkides' story would have been a prospector's dream—except that he never was a prospector but a miner engaged in tin production in Kigezi when his big break came. When his car stalled on a mountainside one day, some two miles from the Belgian Congo, Kikkides chanced to notice some black earth, staked the claim that today supplies a large portion of the tungsten consumed by Great Britain's steel industry.

The mountainside Kikkides mines actually lies in a no-man's-land—between the customs posts of Uganda and the Belgian Congo, some 7,000 ft. above sea level. It's an impressive sight to prospecting Westerners. From the owner's front door, a chain of volcanoes (all over 11,000 ft. high) stretches toward Lake Kiwi in the Congo; beyond the bamboo-covered ridges lie Lake Edward and Albert National Park—the home of the giant gorillas.

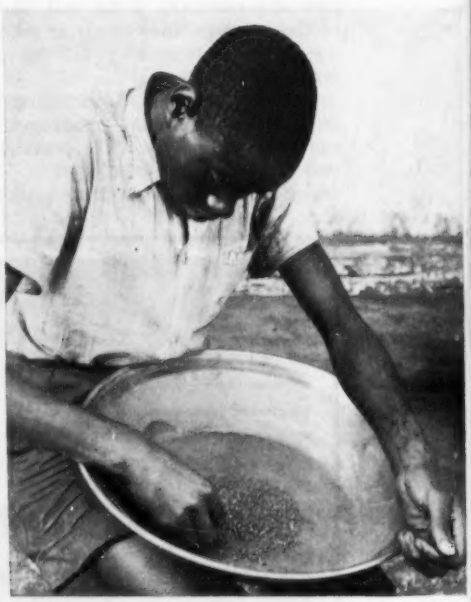
Kikkides' help is all native (apart from three foremen imported from Cornwall). Production methods are still primitive; transportation (by lorry, river barge, lake steamer and rail) is a continuing hardship.

Developments currently under way stand to alleviate the situation, however. Communications are gradually being opened up (thanks to an interested British steel industry); more modern mining methods are being inaugurated to transport the mineral down the giant flight of steps carved in the hillside.

But living conditions in the area are still difficult. Kikkides and his wife Nikkie (a dentist) have lived on the site of their present home since 1943, import their staple foods and clothing from across the border in the Congo.



KIKKIDES: Owes his tungsten fortune to a faulty auto clutch.



PRIMITIVE PRODUCTION: Developments will speed up output soon.

Nearest town is Kampala—capital of Uganda—some 200 miles to the east.

"As long as it's such a profitable venture," notes Kikkides, "no sacrifice is too great." Tungsten has been selling in Great Britain as high as £1,500 a ton; the British steel mills have proved eager and demanding customers. What other minerals the area can produce has yet to be discovered, but interested geologists predict great wealth in the Uganda pocket.

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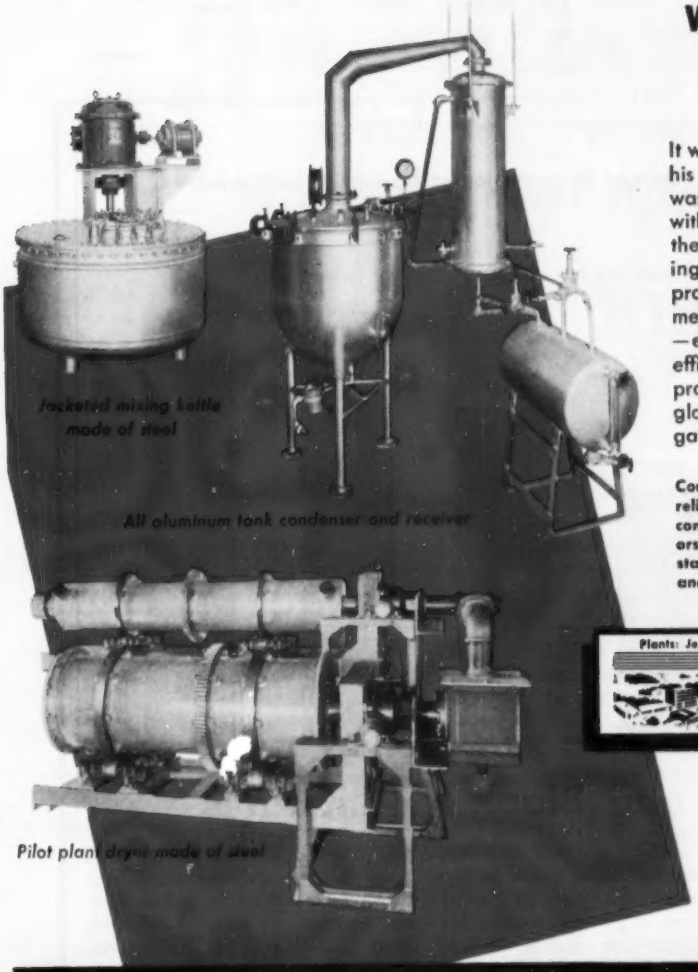

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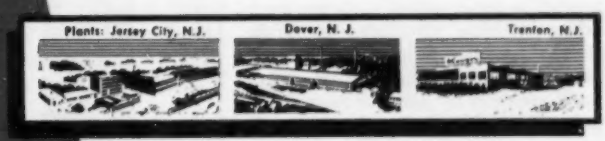

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WIDE WORLD

CALIFORNIA'S KUCHEL: Air pollution—as serious as grain spoilage?

Valor in Vain

Undeterred by the fact that Congress has been shunning action on a dozen bills dealing with pollution control, freshman Sen. Thomas Kuchel (R., Calif.) has introduced still another bill (S.3115) aimed at encouraging industry to put money into pollution abatement.

Because they stand little chance of getting attention this session, the immediate effect may be to delay progress in control of pollution. Reason: a manufacturer stands to receive tax benefits on pollution control projects completed *after* passage of the bills; so long as Congress allows those bills to gather dust in their respective pigeonholes, some manufacturers may feel like postponing action on pollution control, not wanting to complete such projects just before the tax relief measure goes into effect.

Kuchel's bill would give air pollution control expenditures the same tax status as has already been extended to construction costs for such other laudable structures as grain storage facilities. The feeling behind his bill is that prevention of smog and contamination by harmful fumes is as important as prevention of grain spoilage.

Essence of S.3115 and similar bills introduced in the House by Reps. Glenard Lipscomb (R., Calif.) and Charles Kersten (R., Wis.): the Internal Revenue code would be amended to permit accelerated amortization (five years) of equipment for collection at the source of atmospheric pollutants. The Kersten bill also would cover equipment for water polution control, and another ten bills relate only to water pollution.

Semantic Stumbles

Tackling the problem of company communications, the Commercial Chemical Development Assn. last week pointed up a problem that's becoming ever more pressing to the chemical industry.

Adequate, effective transmission of ideas—the means by which management makes its wishes known to employees, and employees in turn outline their problems to management—has been generally overlooked in the scramble to "get along with the production race."

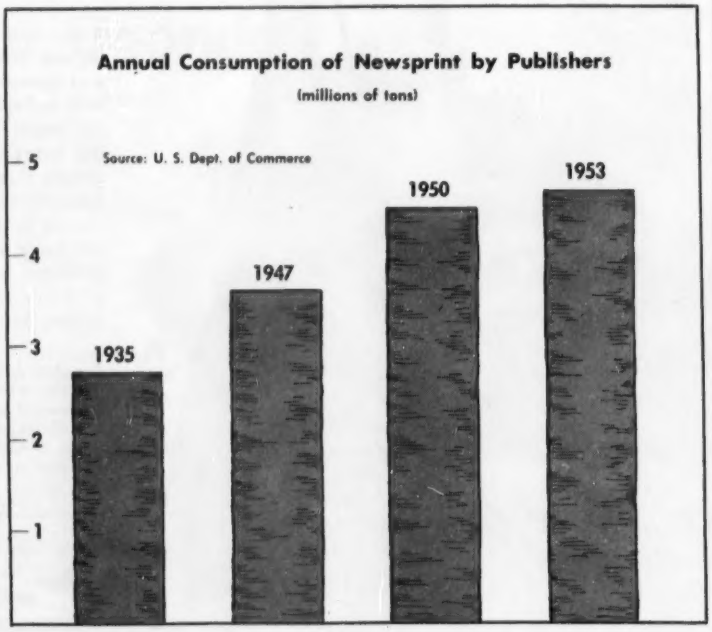
But the problem of communications is one that can't be long overlooked without disastrous effects. Emotions and attitudes are rocked by faulty communications; bonds of common goals can be destroyed by unconscious inconsistencies in understanding.

One common product of bad communications within the company framework, CCDA spokesmen point out, is the failure to communicate because the "expectancy of the recipient is different from that anticipated by the stimulator." As an example: works managers and sales managers can become embroiled in a row over sales forecasting, stumbling over a simple definition of the word sales. Or: conflict between directives and values can arise in a company because of a continued diet of misconstrued goals.

Timing is an all-important factor of communications, speakers state, "and is not to be construed with executive procrastination." Employees stand up better under wrong decisions than no decisions at all; human beings can stand almost anything better than being ignored.

Chemical companies, by and large, have tended to minimize the problem, industry spokesmen admit, "but many are now waking up to the consequence of their negligence."

IMPACT



Oil and Black for Literates

ALONG WITH the rise in newsprint consumption in the U.S. (up 30.9% over the past six years) there's been a growing market for carbon black and mineral oil producers. Calculating that the average ton of newsprint uses 32-36 lbs. of ink (28.2-32.4 lbs. mineral oil, 3.2-4.3 lbs. carbon black), America's newspaper-reading habits have accounted for a 1-million-ton increase in mineral oil sales since 1950, over a 405,000-ton hike in carbon black sales. Result: a mighty impact on corporate earnings.

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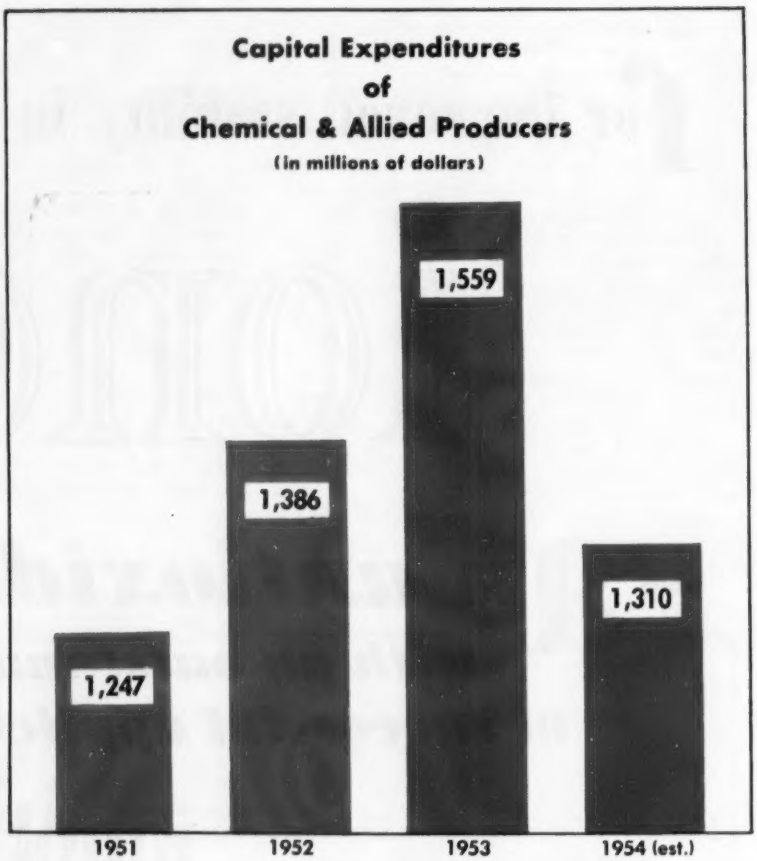


Set for a Sharp Plunge

Capital expenditures in the chemical industry this year got off to a fast start—set an all-time first-quarter high in over-all spending. But the skyride's almost over. According to latest statistics compiled by the Securities & Exchange Commission, chemical expansion is in for a decline during the second quarter of 1954; year-end spending for new plant and equipment should be considerably less than in 1953. Quarterly estimates:

	1953	1954
	(millions of dollars)	
Jan.-March	353	370
April-June	416	353
July-Sept.	376	287*
Oct.-Dec.	414	300*
Total	1,559	1,310

In dollar figures, the total expansion projects in the chemical industry this year will amount to $1,310 million some 16% below 1953's record $1,559 million.

Statistics-sated Washington observers note, however, that businessmen have been known to change their minds before. When SEC's statistics were compiled (in February) the downturn in business had already been under way seven months "with no dampening effect on first quarter 1954 spending plans." It's possible that many chemical firms—with inventories at more realistic levels—will dust off expansion plans in the next few months, push estimates upwards.

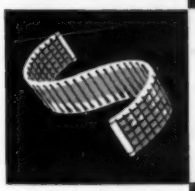
Adding to the chances of revision upward: proposed faster amortization, other Eisenhower-sponsored business-assisting amendments, including a tax program designed to offset declining investments (*CW, Mar. 27*).

There's no way of estimating, of course, just how much of the capital ticketed for chemical expansion will go toward construction of new facilities this year. One industry spokesman estimates "a major share of it this year will be tied up in modernizing equipment . . . to pare costs."

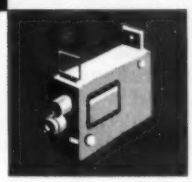
But that the big expansion boom's over—for the moment—is an accomplished fact.

* CW estimates.

Coffee Maker



Flexible Watch Bands



Camera

Phosphoric Acid

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Another example of how industry uses VICTOR products

Electro-polishing with phosphoric acid is one of the main reasons for the rapidly growing popularity of stainless steel flatware. Nothing else could economically give "stainless" its lustrous, gleaming finish except an electro-polishing bath containing phosphoric acid.

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PHARMACY POLICER SHEA: A harsh view of brand switchers.

LEGAL . . . . . .

Profuse Policing: It may be sporadic and it may not catch all the law violators, but there's a lot of policing of industry going on these days:

• Just before Chairman Timothy Shea ended his 20 years of service as a member of the Massachusetts Board of Registration in Pharmacy, the board summoned six pharmacies in that state that had been accused of substitution in the filling of prescriptions. Those charges had been brought by Abbott Laboratories, North Chicago, Ill., which asserted that the druggists had dispensed substitutes in filling physicians' prescriptions calling for Abbott's Nembutal capsules. Upon finding the pharmacies guilty, the board put the pharmacy owners or managers on probation for one year, and warned that if other violations should occur, the board would move to revoke—not just suspend—their licenses.

• Latest monthly report of the U. S. Food & Drug Administration, riding herd on manufacturers and retailers of drug products, shows seizure of nine drugs and devices for alleged labeling with misleading therapeutic claims, three for failure to give adequate directions for use, and five others for faulty composition or contamination. In federal court cases, one drug maker was fined $550 because its vitamin products were "contaminated with living microorganisms"; another was fined $400 because its dexedrine-amphetamine sulfate tablets were not at purported strength; and nine druggists were fined for selling various drugs without physicians' authorizations.

• Still another agency getting its licks in last week was the Federal Trade Commission. Latest cease-and-desist orders have gone out to Anchor Serum Co., S. St. Joseph, Mo., and the Hair & Scalp Clinic, Inc., Washington.

•

Grim on Green: A second manufacturer of drugs and cosmetics has jumped into the "fair traders" battle against the use of S&H Green Stamps in Roanoke, Va. (*CW, March 20*). The Mennen Co., Newark, N.J., is asking the Law and Chancery Court there to order a local retailer to stop giving the stamps—which later may be redeemed for merchandise—with the purchase of Mennen products on which a minimum resale price has been set.

•

Crime and Punishment: On another front, "fair traders" are pondering a campaign to get state legislatures to make violation of fair-trade laws a criminal offense. A spokesman for the National Retail Dry Goods Assn., calling it "fantastic that people now can violate the law with impunity," says the association's lawyers are studying ways of putting more "teeth" into the various state fair-trade laws.

LABOR . . . . . .

Balance of Power: Signs of a shift in relative "economic warfare" strength are seen in the wave of industrial peace that swept over the labor-management border this week. In general, the companies appear stronger than in recent years, the labor unions somewhat weaker. Among recent strike endings:

• Approximately 1,400 members of the International Chemical Workers Union (AFL) accepted an 8½¢/hour pay increase, ending their one-week strike against Hercules Powder Co. at Sayreville, N.J.

• Early last autumn, a 750-member affiliate of the Engineers & Scientists of America was able to win "substantial" benefits in its 9½-week strike against the Arma Corp.; but last month, an ESA unit representing 1,700 of the 2,300 engineering employees of Sperry Gyroscope Co. was less successful in striking. The walkout lasted two weeks, but the Sperry plant at Lake Success, N.Y., was out of production less than one week, as the CIO production employees honored the ESA picket lines only the first week, then returned to their jobs "by agreement." Terms accepted by the ESA group were nearly the same

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BENZYL CYANIDE
n CAPROIC ACID
DIPHENYL METHANE
ETHYL FORMATE
ETHYL MALONIC ESTER
ETHYL PHENYLACETATE
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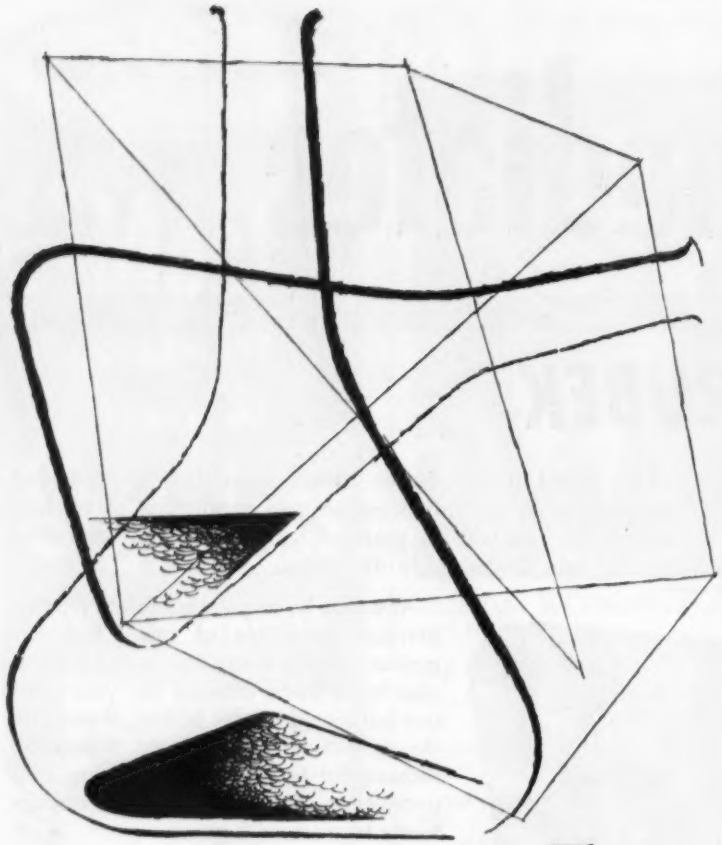

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Chemical Industries

are always in transition

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THE SHOW GOES ON: Sheriff's depu-

as those offered by the company the day before the strike started.

• At Morgantown, W. Va., the 230 AFL plumbers, carpenters and electricians who had been striking for a 20¢/hour package wage increase suddenly flocked back to work—after the company announced it would begin interviewing persons applying for the strikers' jobs. Production at this Mathieson ammonia plant was not interrupted, as the production workers —some 500 members of District 50, United Mine Workers—stayed on their jobs throughout the 20-day walkout. The AFL members said they were "temporarily foregoing our basic American freedom, the right to strike, to demonstrate our good faith and help bring about a peaceful solution."

• A four-week strike at the Robeson Process plant at Erie, Pa., ended with the 57 AFL strikers accepting a 5¢/hour wage increase retroactive to Jan. 28, a change in the vacation plan, and an "understanding" about seniority provisions.

While these strikes were folding up, Secretary of Labor James Mitchell was telling members of the American Retail Federation that better personnel policies can help build industrial peace. He added that labor and management should not look to government to solve all their differences.

•

Unbridled Unions: Possibly an exception to the weaker-union trend is Local 595, AFL Ironworkers, at Paducah and Calvert City, Ky., which exhibits no frailty in its dealings either with companies or with its own parent union. Seeking a $1.25/day travel allowance and a higher wage scale,

ties open picket lines for Mathieson men.

Local 595 has been striking against the Fluor Corp. and United Engineers, thus stopping work on expansion projects at B. F. Goodrich Chemical and National Carbide plants—total construction cost estimated at $20 million. Local 595 and its business manager are in court contesting the Ironworkers' attempts to remove the local's officers.

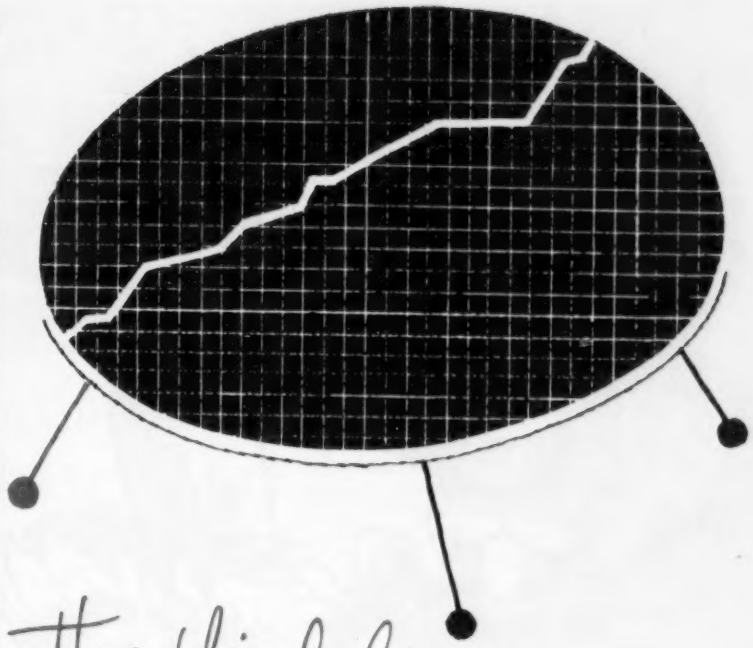
FOREIGN . . . . .

Soda Ash/Netherlands: Involved in a joint venture to launch a soda and allied chemicals industry in the northern part of the Dutch province of Groningen are the Royal Netherlands Salt Industry, the Netherlands Oil Industry (jointly owned by Royal Dutch-Shell and the Standard Oil Co. of New Jersey), the State Coal Mines, and the Ketjen Sulphuric Acid Co. Total cost of the project: $13.4 million—$5.5 million of which will be supplied by government-guaranteed loans. Construction dates have not yet been revealed.

•

Propaganda/East Germany: In an obvious attempt to scuttle the thriving West German trade in the Middle East, the Soviet-dominated East German Republic has opened a costly industrial exhibit in Cairo, said to display $3 million worth of materials weighing over 600 tons. German scientists, technicians have been sent to Cairo pledged to sell "the superiority of East German consumer goods;" there's an open emphasis on chemical processing equipment.

West Germany (sporting a flourishing export trade in chemicals with



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B & I. . . . . .

Egypt) was refused permission to organize an industrial fair in Cairo this year. Reason: the Bonn government's decision to pay $800 million reparations to Israel, despite Arab protests.

•

Cement/Korea: The United Nations Korean Reconstruction Agency (UNKRA) within the next several weeks will contract to build a $5.5-million cement plant in Mungyong, Korea. It's expected the contract will be a package deal (negotiated from UNKRA's New York office), but because of currency problems, specifications as to where certain parts of the plant are to be bought may be included in the deal. When completed (in 1956) the plant will double Korea's present cement capacity (to 200,000 metric tons/year), about one-third of the country's reconstruction requirements.

•

Copper/Chile: The Minister of Mines, Santiago, says that all or part of Chile's stockpile of copper (estimated at about 170,000 tons) will be sold to the U.S. Domestic sources in the U.S. are frankly skeptical, however, "at least until the Chilean government has passed legislation giving better tax and exchange treatment to U.S.-owned Chilean copper mines."

KEY CHANGES. . .

George S. Wheaton, to manager, Eston Chemicals Div., American Potash & Chemical Corp., San Francisco.

C. A. Butler, Jr., to director of commercial development, and **Loren Scoville,** to director of engineering, Diamond Alkali Co., Cleveland.

Russell L. Jenkins, to associate director of inorganic chemical research, Research and Engineering Div., Monsanto Chemical Co., St. Louis.

Maurice H. Pickard, to director of technical service and product development, Pacific Coast Borax Co., New York.

Herbert H. Clarke, Jr., to vice-president and general manager, Chemical Div., The Borden Co., New York.

Herman Sokol, to vice-president in charge of research and development, Heyden Chemical Corp., New York.

DIED. . . . . .

Marston Taylor Bogert, 85, professor emeritus of organic chemistry, Columbia University, and former president of the American Chemical Society, in New York.

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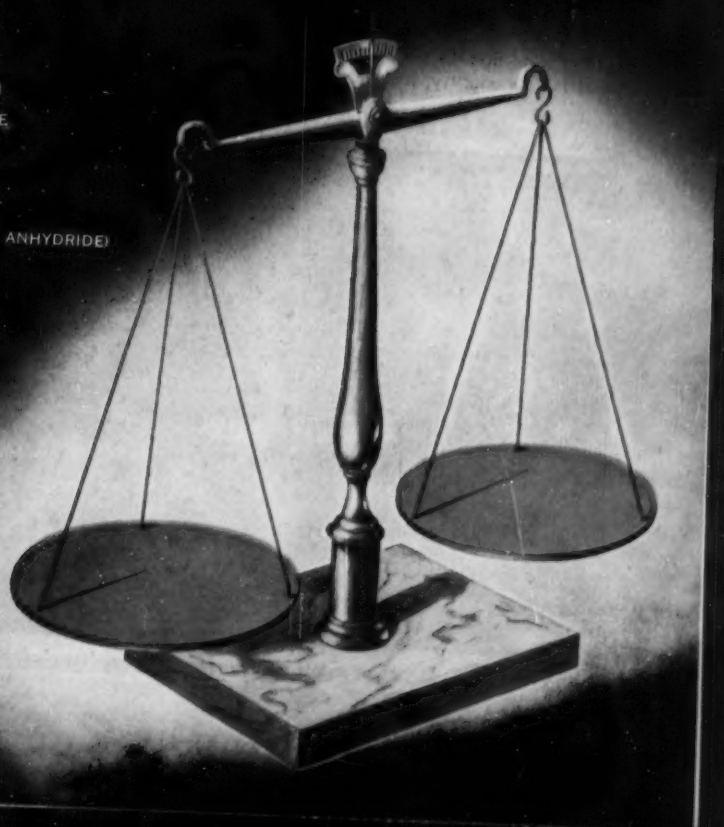
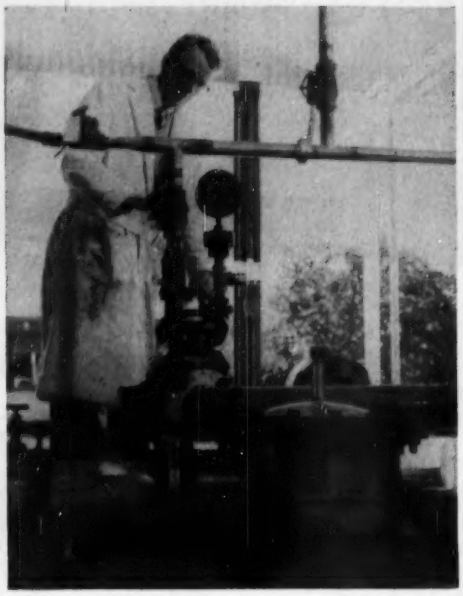
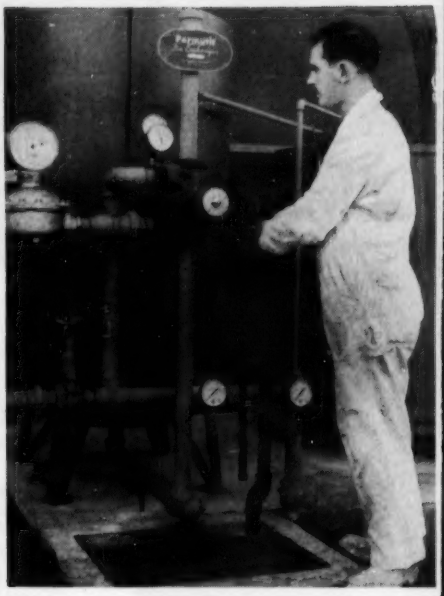






STARTING, basic vinyl acetate emulsion goes to processing tanks (left), is blended with additives, softened (unit right) water.

Paint Maker Tries Split-Level Housing

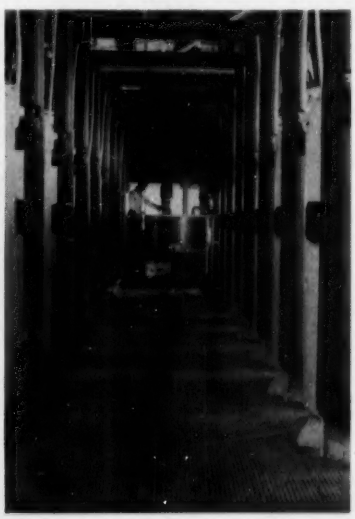
Formal opening of the Gelvatex Coatings Corp. polyvinyl acetate paint plant in California last week meant more than a big step for a young, aggressive paint maker. Following hot on the heels of Standard Oil of California's first offering of its odorless paint thinner (*below*) it boldfaced the fight between emulsion and oil paints.

Gelvatex, first to produce a PVAc paint in this country, has been one of the leaders in the fight, and its brand-new plant attests to the success of its battle so far. Production will be increased sixfold by the new facilities.

Because there are some novel paint-making angles in the new plant, CW's camera stopped in Anaheim (near Los Angeles) and toured the $600,000 facilities.

Triple Level: Fluor Corp. designed and built the new 16,000-sq.-ft. unit, which represents an interesting compromise between the old, multistory, gravity-flow paint plant and the "ranch style," one-level plan that has found recent favor with many firms.

The structure, with cement-brick base half and corrugated Transite top half, is a three-level approach to paint mixing problems. Formulation begins on one 20-ft. mezzanine, moves to a second, 10-ft. mezzanine, and ends on



FORMULATING: Dry components from hopper, emulsion from below, are mixed on upper mezzanine, then drain to terminal tanks.

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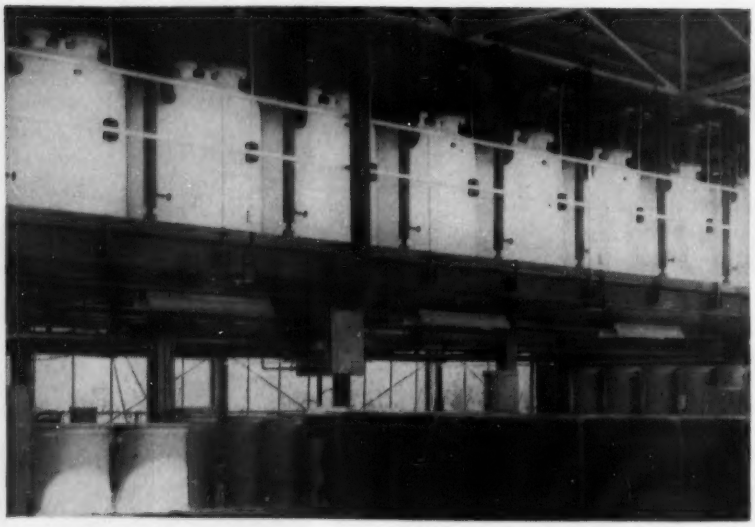
NaCl	0.5% max.	2.0% max.
Na_2SO_4	1.15% max.	2.0% max.
pH at 5% active	7.0-8.5	7.0-8.5
Color, VCS	2 max.	2 max.
Iron, ppm	7.5 max.	7.5 max.



TERMINAL TANKS on lower mezzanine are mixer-equipped, hold paint for canning.

FINISHED PAINT is stacked in ground floor storage area.

the ground floor. Gravity feed eliminates many pumps, and a monorail system obviates hand carts and elevatoring.

Drummed In: Basic raw material for Gelvatex paints is Gelva PVAc dispersion made by Shawinigan (Gelvatex is a subsidiary of Shawinigan, but not a wholly owned one). It comes in 50-gal. drums, and receives a preliminary mixing in a separate, 2,000-sq.-ft. sheltered area. There, in three 10,000-gal. stainless steel tanks, it is blended with additives and homogenized (details on this phase Gelvatex keeps a close secret).

Until ready for use, the dispersions are stored in the main production area; they can be piped from there to the 500-gal. mixing tanks on the upper mezzanine. Piping, valves and tanks are arranged so that flow pattern can be easily altered—to make different products, or to bypass an out-of-order tank.

Pigments and other dry materials are hoisted from the storage area to the upper mezzanine by a monorail system. American Monorail devised the setup; hoisting unit moves on two tracks, 75 ft. long, 25 ft. apart, and eliminates hand pigment transfer.

The system has a special safety factor: ground floor control of the hopper will move it only to the mezzanine edge, where another operator there can take over. The arrangement prevents a workman from getting slugged with a hopper controlled by someone who can't see him.

Paint thinner—water—is Los Angeles tap water that has been softened by a Permutit unit. Otherwise, high ion content might cause colloid trouble.

Mezzanine Wait: Finished paint is drained down to 32 terminal storage tanks, one for each of Gelvatex's standard 24 exterior colors, and one for the five basic interior colors (the other 11 are made by intermixing the basic colors). The rest are for special finishes—like clear glaze and redwood finishes.

A mixer on each of the terminal storage tanks keeps the contents agitated until they are piped by gravity feed to the canning area on the ground floor. After packaging in various-size cans, labels are applied by hand. The firm is selling a considerable portion of its output under other firms' labels, and until their "take" and number has been settled, Gelvatex will stick with hand labeling.

On the Move: The new plant is the third home for Gelvatex, which in its short history since 1950, has moved from its original home in Oakland to Pasadena and thence to Anaheim.

The firm is the baby of John Beggs, a dynamic Englishman who had worked out a PVAc paint in Britain before the war, and who had originally used I. G. Farben PVAc emulsions. When these were unavailable, he switched to Shawinigan products, and after he had come here, Shawinigan backed him in setting up Gelvatex.

Originally, the firm made only exterior paints. The PVAc coatings seemed particularly well adapted to the dry climate of southern California, and well suited to the stucco structures common in that area. Beggs began by distributing his paint through paint contractors and industrial users,

HAND LABELING: Cans arrive on roller conveyors from the filling area.

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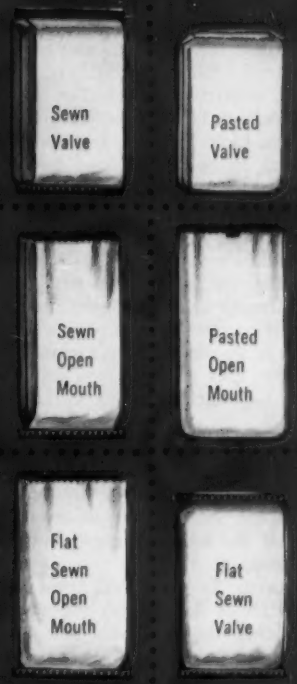

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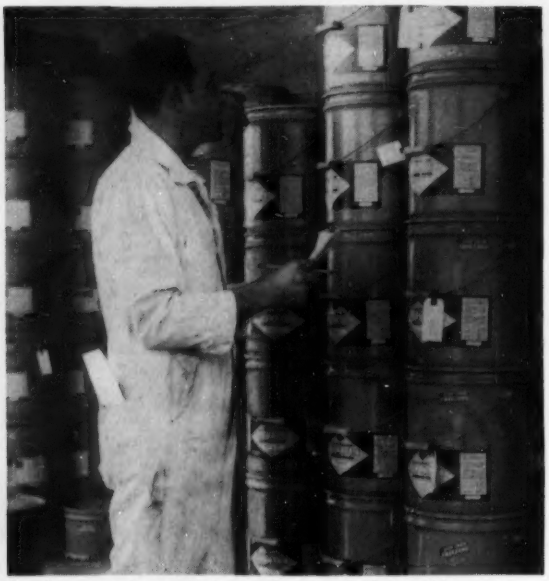


END OF THE LINE: Color matching (left) is done by hand, takes experience. Paint is then readied for shipment.

changed last year to direct dealer outlets.

Since that time, he's built up 150 outlets in California, Arizona, New Mexico and Texas.

Little Leader: Still a small firm, compared with giants like Fuller, DuPont, and Sherwin-Williams, Gelvatex is, nevertheless, ahead of them, Beggs feels, in PVAc paint technology and know-how. His firm is about the only one to sell a line of interior finishes based on PVAc—most of the PVAc paints sold by other firms are interior primer sealers (*CW, Nov. 14*) —although a number of firms are said to be readying similar products.

And though Gelvatex is best known in the West, Beggs is plainly eyeing the rest of the country: he's opened a sales office and warehouse in Florida, and is negotiating in several other states.

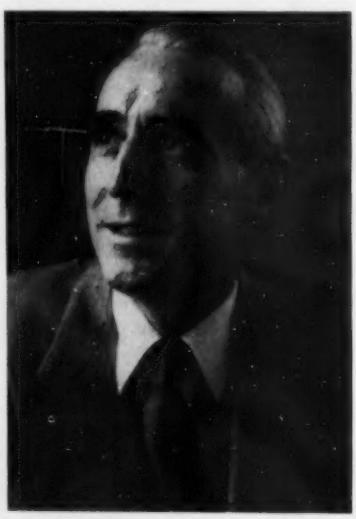
Beggs feels that there's a big potential for PVAc paints, but like the details on how he makes his paints, he's keeping most of the information to himself. He does offer some cautious predictions:

California, he feels, can probably take up about 3-4 million gal./yr. of PVAc paint. Beggs figures that Gelvatex, under its own and other labels, will provide at least 20% of that potential—which indicates that he's anticipating plenty of competition.

Around the House: The competition, of course, won't be confined to PVAc paints. Outside, there will be increasing rivalry with paints based on butadiene-styrene latex (*CW, March 13*). And acrylic resin paints offer a number of desirable qualities, too, that might put them in the exterior paint picture before the year is out.

Inside, there's the frequently emphasized battle between odorless oil paints, butadiene-styrene, acrylic, and PVAc paints. This fight is far from over; this year is, indeed, one of the most crucial in the history of interior paints.

Gelvatex is plainly betting the PVAc has enough merit to justify its expansion, and its rapid three-year growth seems to bear it out. With its new plant it has gained capacity and more efficient production. Now the job is to gain a wider market.



GELVATEX' BEGGS: First with PVAc.

Newest Thinner

Last month Standard Oil of California officially began selling its new odorless paint thinner made in the alkylation units of its El Segundo unit. The product, a combination of highly branched isoparaffins, is simply dubbed Standard Odorless Thinner.

Standard says that while it will push the product as hard as it can, production will be limited until September. Until then, it will be sold on a "first come, first serve" basis.

Standard claims that the thinner has less odor than ordinary tap water, also that it has far greater stability than many odorless thinners.

It is the aim of Standard to develop a product with sufficient solvency qualities to permit oil paint makers to gain back the ground lost to the "do it yourself" emulsion finishes.

Cost of the new thinner is 8½¢ higher than the cost of conventional petroleum mineral spirits.

•

Sulfa for Children: Sulfa drugs for children's infections got two boosts last month. Dr. Sidney Ross of Children's Hospital, Washington, D.C., told an FDA symposium on antibiotics that they are still the first choice of many pediatricians. He explained that they are easy to administer, low in cost and are the drug of choice in combatting meningococcus infections. The other boost came from Dr. David Lehr of New York who wrote in Antibiotics and Chemotheraphy that triple sulfa mixtures are pre-

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ferred for systemic infections because they minimize the danger of renal complications.

•

Safe in Smog: The Varnition Co. (Burbank, Calif.) offers a new synthetic rubber coating called Varnition Solvent Proof Paint. The firm says it eliminates spoilage of paint by solvent spills and protects rubber products from destruction by atmospheric ozone. It is nonflammable, requires no primer. Application is by brush.

•

Local Soother: Benzolin, a local anesthetic for topical use is now being offered ethically by George A. Breon & Co. (New York). In a greaseless base the active ingredient is 0.5% 2-butoxy-N-(2-diethylaminoethyl) cinchoninamide hydrochloride.

•

Compatible, Cheap: You can now get Pittsburgh PX-114, a new low-cost phthalate plasticizer from Pittsburgh Coke & Chemical. Said to be compatible with other plasticizers, PX-114 (decyl butyl phthalate) will give vinyl plastics good low-temperature flexibility, good mechanical properties, and permanence.

•

Resistant Grease: Keystone Lubricating Co. (Philadelphia) now makes a solvent-resistant grease named Lubricant A-9. It has an operating range of 200 to 400 F, is available in a number of densities, and can be applied by means of cup, gun or weight-loaded sealers.

•

Glass Cleaner: Earl Witt, Inc. (Chicago) is putting out a cloth form of glass cleaner tradenamed Trix Kloth. It's used with water, action is described as "magnetic", and it's guaranteed for a year. Price: $1.00.

•

No Melting Point: Tri-State Petroleum Co. (Philadelphia) now offers two new special lubricants. No. T/S-21 multipurpose ball and roller bearing grease, according to the firm, has no melting point, will not break down or bleed, can be pumped at temperatures below zero. The second product is No. T/S-21 S, a high-temperature grease said to have no odor and not to stain fabrics.

•

For Fabrics, For Rugs: Adhesive Products Corp. (New York) now markets these products:

- Nu-Fab, a plastic-rubber fabric paint. It is said to rejuvenate worn or faded fabrics. Applied by brush, it dries in 30 minutes, may be washed in boiling water.
- Griptex, a liquid rubber plastic, which when applied to rugs makes them skidproof. It's said to dry tack-free.

•

Rancidity Deterrent: Koppers Co., Inc., chemical division has just introduced an anti-oxidant claimed to deter rancidity in fatty foods. Called DBPC, the product is di-*tert*-butyl-*p*-cresol. It comes in crystal form.

•

Antibiotic Adhesive Bandage: The $32-million adhesive bandage market has been invaded by a newcomer, Bio-Band. A product of Multibiotics Corp. of America (Baltimore), it is impregnated with a combination of streptomycin, polymyxin and Bacitracin.

•

Antiflea Aerosol: Armour Veterinary Labs., division of Armour and Co., recently brought out Flea-A-Sol, a 12-oz. aerosol for dogs and cats. It contains chlordane, pine oil, hexachlorophene, lanolin. Price: $1.75.

•

Destaticking Boot: Federal Chemicals Corp. (Brooklyn, N. Y.) has developed a destaticking-type boot that may be worn over street shoes. The boot is made of a conductive material produced from a vinyl plastisol. The company doesn't manufacture the boot, only the plastisol. It is recommended for use in plants where there are flammable dusts and volatile solvents.

•

New-Type Gasoline: Phillips 66 Flite-Fuel, a new premium-grade gasoline, recently went on sale in seven states. The fuel contains di-isopropyl, is said to provide increased power. Phillips says it was originally developed for military aircraft use.

•

Fires And Cigarettes: The Hon. Stuart Garson, Canadian Minister of Justice, recently told the House of Commons that he was prepared to consider

Major League Tryout

ON DECK: laminated baseball bats for the big leagues. Here American League Pres. Will Harridge and Red Sox Manager Lou Boudreau talk over the new stick with a couple of Boston sluggers, Jackie Jensen and George Kell. The new-type bats, approved for high schools and colleges for more than two years, haven't yet been okayed for the majors.

Rules prevent the bats' contributing to longer hitting, so they are pushed as being better balanced, longer wearing. Generally, five to seven ash boards (and sometimes a hickory core) are laminated with a water-resistant glue – urea-formaldehyde where a light glue line is desired, resorcinal for a dark line. After the blanks are cured, the bat is turned and finished as usual. The glued models take more manufacturing time, but save in timber costs.

Among the leaders in making the new bats are Bancroft Racket Co. (Pawtucket, R. I.), Joe Engle Bat Co. (Chattanooga) and McLaughlin-Millard (Dolgeville, N.Y.).

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In the manufacture of anti-malarials and long-chain quaternary ammonium compounds.

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the suggestion that tobacco companies be compelled to manufacture cigarettes that would burn out soon after they were discarded. The aim is to reduce the number of cigarette-caused fires. It is suggested that cigarettes could be made to extinguish themselves quickly by the application of chemicals to the paper, and that cigarettes with cork or filter tips seldom start fires.

•

Soap Company: The Bates Soap Corp. has just been formed in Buffalo, N. Y., with a capitalization of $100,000. It will make soap, cleaning compounds and allied products. President is Harold R. Bates.

•

Control Booklet: The Assn. of Economic Poisons Control Officials,' just-issued annual publication, a 200-page booklet, offers information on state pesticide laws and on 150 pesticide chemicals. Price: $3/copy. Copies can be obtained from the association at College Park, Md.

•

Expansion: These four companies report new facilities:

• Witco Chemical Co. is enlarging its drier plant in Chicago. The firm says the move will increase production of naphthenate, octoic and tall oil driers.

• Union Bay State Chemical Co., Inc. has completed its new latex polymer plant. It was designed to manufacture the Ubatol series of polymer emulsions.

• Ekco Products Co. has opened a branch plant of its National Glaco Chemical Corp. subsidiary in Baltimore.

The facilities will service bakers in the Baltimore-Washington area.

• Western Phosphates, Inc. is now producing phosphatic fertilizer at its new $5-million plant at Garfield, Utah. Initial annual production will be around 90,000 tons.

• Summers Fertilizer Co. (Baltimore) reports that its new plant at Sioux Falls, S. D., is now in operation. Annual rated capacity: 40,000 tons.

• Standard Chemical Products Co. moves into its new plant in Charlotte, N. C., this month. The firm expects the plant, which will produce textile oils and chemicals, to be in operation next month.

• Arner Co. (Buffalo) has plans to increase its tablet-coating capacity by one-third.

•

Clean Standards: Recently formed was The Hand Laundry Institute of New York which claims 3,000 members. Purpose: to establish laundry standards and to set up a seal identification program among manufacturers of launderable materials.

•

Added Property: Hooker Electrochemical Co. says that its polyester resin, Hetron, is now light-stable as well as fire-resistant.

•

Two More: The Borden Co.'s chemical division has just brought out two new water paint bases. Polyco 556 is a freeze-thaw stable butadiene-styrene, Polyco 522 is a polyvinyl acetate emulsion.

•

New Colors: Krylon, Inc. (Philadelphia) has added six new colors to its acrylic spray coatings.

Packaging's Bite

Useful yardstick with which a manufacturer can check his packaging costs against others in his field can be found in a recent issue of *Modern Packaging* magazine (March, '54). Drug, paint, and specialties makers all should be able to profit from the study.

Because of the seeming lack of surveys of this nature, the magazine set up its own definition of costs; included only direct packaging material, packaging labor, and packaging overhead. Results were expressed as percentages of the factory selling price (not retail price).

Topping the list of some 19 general product fields were inks and adhesives —40% of the maker's price went for the package. But close behind were cosmetics and toiletries (36.3%) and drugs (35.2%). Some other chemical specialties were nearer the median—wax polishes (15%) and paints (12.5%).

No specialties were particularly out of line; in the case of motor oil, 35% of the price goes to packaging; 30% with beer, 24.1% with foods, 6.5% with meats. The magazine points out that with low-cost items like inks, beer, motor oil, etc., packaging products at any price will constitute a sizable portion of the factory selling price.

This point is emphasized with examples like toothpaste, where 70% of the cost goes for wrapping, tube, etc., and soaps, where 50% of the price is used for packaging. Generally speaking, smaller items cost more (percentagewise) than large ones.

Modern Packaging, in its report, emphasizes that none of its figures is to be used as a hard-and-fast rule, and that the sample surveyed was rather small. Nevertheless, the survey can be helpful.

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WHY low-cost Castorwax is used

	Extreme Insolubility	High, Sharp Melting Point 86°C.	Hardness	Non-Toxic	Good Dielectric	Resin and Wax Compatibility	Water Proofness	Non-Yellowing White	Grease Proofness	Formulation Data Available
Adhesives	✓	✓		✓		✓	✓	✓	✓	✓
Candles		✓	✓			✓		✓		
Crayons		✓	✓	✓		✓	✓	✓		
Foundry Waxes		✓	✓			✓	✓			
Gasket Impregnant	✓	✓				✓	✓		✓	✓
Grease (Lub)		✓								
Hot Melt Compounds	✓	✓		✓		✓	✓	✓	✓	✓
Leather Coatings	✓					✓	✓		✓	✓
Metal Working		✓	✓			✓				✓
Mold Lubricants		✓		✓		✓		✓		
Packings	✓	✓		✓		✓	✓			✓
Paper Coatings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Polishes		✓		✓			✓	✓	✓	✓
Potting Compounds	✓	✓			✓	✓	✓			✓
Rubber Compounding	✓					✓				
Sealants	✓	✓		✓		✓	✓		✓	✓
Textile Finishing	✓	✓				✓				
Transfer Inks	✓	✓				✓	✓			

For complete coverage of the uses of Castorwax and formulation information send coupon for Technical Bulletin No. 7

12-HYDROXYSTEARIN AS A CHEMICAL INTERMEDIATE

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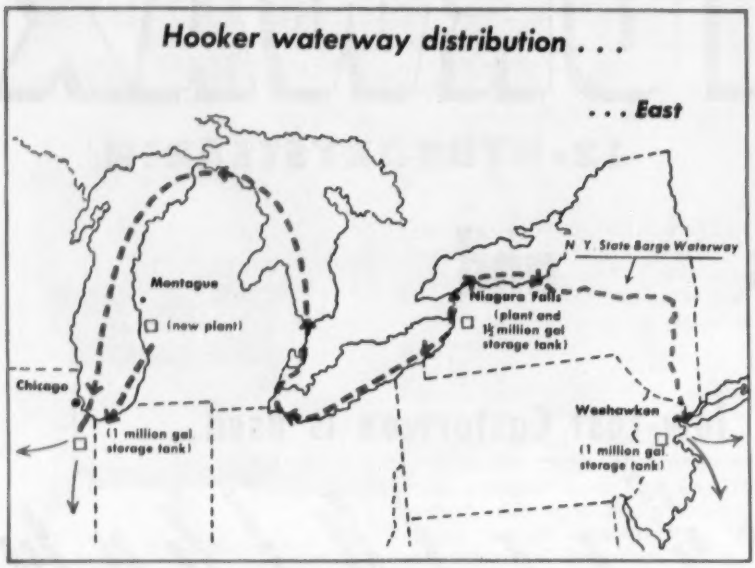


Building on a Water Base

A few days ago, Hooker Electrochemical switched on its new $12-million chlorine-caustic plant at Montague, Mich., forged another important link in its chemicals distribution chain.

The Montague plant is, of course, only the latest in a series of moves by Hooker to integrate its services to customers in the East and Midwest. Some previous and other steps in the same direction:

• Currently rising at river's edge across from the Niagara Falls plant is a 1½-million-gal. tank. Destined to expedite "dockside delivery" of 50% liquid caustic soda, it's the latest Hooker storage facility to do the inland waterway system and areas served.

• Two large contract-carrier barges will operate between Montague and the Chicago area, also directly serving customers with deep-water facilities.

• Near Chicago, a recently completed million-gallon storage tank is serving caustic hauled from both Niagara and Montague. Located on the Illinois Waterway at Lake River Terminal, it will supply local customers by way of a newly planned river barge (*CW Newsletter, Mar. 13*). Tank-car shipments are also being made out of the terminal tank.

• Moving eastward, from Niagara through the New York state canals, barge shipments have been unloading at recently leased million-gallon storage facilities at Weehawken, N.J. As at Chicago, direct barge shipments are also being made in the New York area.

Summing up the Hooker delivery system, a company spokesman delineated its aims this way:

"Our decision to make waterway shipments of liquid caustic soda along the inland waterway system was based on long experience with this type of distribution from Tacoma. (*For more news of this operation, see box, p. 43.*)

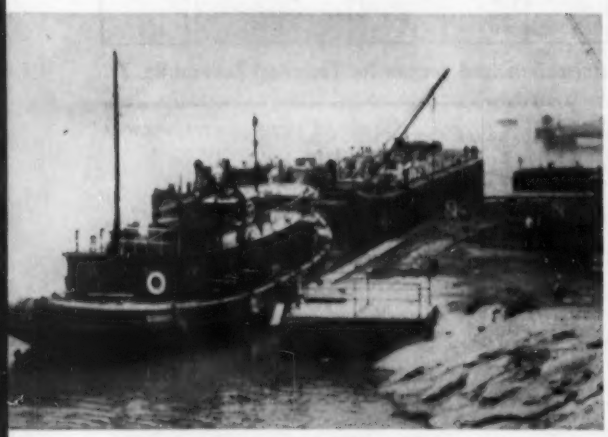
"All our water terminals are situated close to major railroads and truck highways, by which our products move quickly to customers. They augment the regular rail and truck shipments from our plants."

Plant Spotting: Although motivated by the same Hooker desire to gear for optimum customer service, location of the new Montague unit was governed in large part by other considerations. Back in November, '50, Hooker, deciding it would need new chlorine and caustic soda capacity in the near future, cast about for the ideal location to augment and, at the same time, integrate its operations.

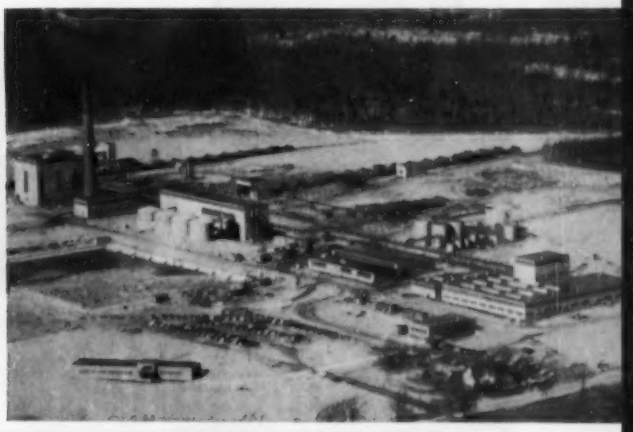
Problem then became one of finding the spot where the combined specifications of raw materials, utilities, transportation and markets would be met.

This is how Montague came to be selected:

• Considering raw material, Hooker learned that the Michigan Salina salt formations extended along Lake



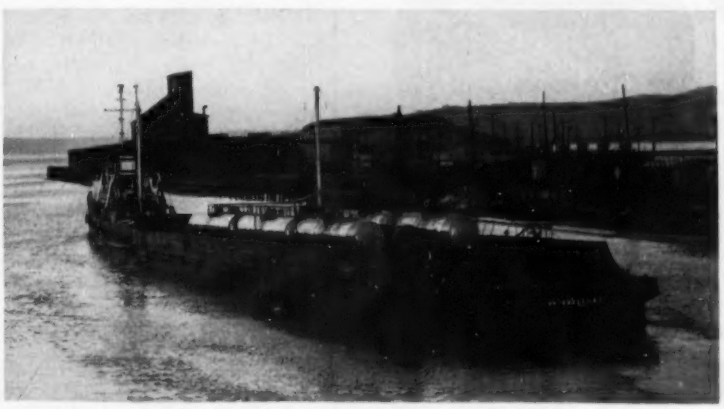
AN EAST-BOUND tug loading at Niagara, a barge unloading at Chicago—two links in Hooker's caustic chain.



A 1½-million-gal. tank rising at Niagara, a $12-million plant onstream at Montague; both underpin a growing chemical structure.

Michigan as far south as Muskegon. Failing to find an adequate plant site at Muskegon or in a southerly direction at Grand Haven, its searchers turned north, finally zeroed in on the Montague area. Uncertain of how much salt would be found at the very edge of the Michigan salt beds, they set as their minimum goal a bed at least 50 ft. and preferably 100 ft. thick. What they actually discovered were two beds with a total thickness of 430 ft.—sufficient salt for many hundred years of operations.

• To hurdle the questions of power



SPECIALLY FITTED Griffco, plying Northwest waters—one sign that . . .

HOOKER'S Western-arm waterway distribution, of long standing, is still being extended. Current plans include:

• A 200,000-gal. tank in Vancouver, B. C., for the storage and distribution of caustic soda in that area through Hooker Chemicals Ltd.

• An expanded barging service, slated to start this summer and to be operated by Foss Launch and Tug Co., to carry chlorine and liquid caustic from Tacoma to the new Ketchikan Pulp Co. mill.

Hooker's water shipments stem 'way back to 1929, when a tanker loaded with liquid caustic made delivery to the Hooker distributing station at Wilmington, Calif. Currently, the California run is made by Union Oil Co. tankers. Delivering fuel oil to the Tacoma plant, they return with caustic to the Wilmington distribution center. Also handled by Union Oil tanker out of Tacoma: bulk shipments, destined for Wilmington, of trichloroethylene produced at the Hooker-Detrex plant. This material was formerly packed and shipped entirely in steel drums.

Another shipping innovation, now routine, is Hooker's use of the Griffiths Steamship Co. barge, *Griffco*, to haul to British Columbia customers. Rails on the barge deck accommodate ten 55-ton chlorine tank cars. Between these cars, three stationary tanks carry an additional 250 tons of chlorine; below deck are tanks with 1,500 tons capacity for 50% caustic.

Over the past two years, Hooker has spent $6 million at Tacoma to increase capacity, improve facilities. A fleet of 253 tank cars, plus barges and tank trucks, are now in service.

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and transportation, Hooker obtained the cooperation of Consumers Power Co. and the Chesapeake and Ohio Railway. The former installed power lines to the site; the latter constructed a two-mile spur line.

• And as to how well it solved the remaining problem, proximity to markets—the consideration about which all others revolved—the company says:

"Montague, located for the use of barges and railroad car floats for outgoing as well as incoming shipments, is spotted within 500 miles of 40% of U.S. population and 50% of U.S. industry."

To add it all up: for the production of low-price basic chemicals like caustic soda and chlorine, selling at between $50 and $60/ton, where the cost of freight for delivery is of major importance, the Montague location, closer to the Chicago and Midwest markets than any other caustic soda-chlorine plant, would be hard to beat.

Small wonder, then, that of a total of $25 million spent by Hooker on expansion during 1952 and 1953, almost half was allocated to the Montague project.

Neighbors, Too: In other ways, Hooker's strategically located Montague plant is bearing fruit.

As mentioned recently (*CW Newsletter, Jan. 30*), at least two other prominent concerns confirm Hooker's choice of site.

• Du Pont's planned $15-million neoprene plant will draw hydrogen chloride gas from Hooker.

• Union Carbide's proposed $1½- to $2-million plant will pipe acetylene to the Du Pont setup.

And although Hooker disclaims any definite plans for further expansion at Montague for itself, it admits that "strong consideration will be given to manufacture of new products there as they are developed."

In fact, so enthusiastic is Hooker management over its latest location that one company spokesman was moved to predict: "There seems to be no question but that the Montague area will develop into a sizable chemical empire in the future."

•

For the Bookshelf: Current offerings:

• American Cyanamid Co. (New York): two new booklets, titled: "Aero Phthalic Anhydride" and "The Chemistry of Melamine."

• M. Michel and Co., Inc. (New York): a revised data sheet covering 15 types of fatty alcohols.

• U.S. Dept. of Commerce: a "Distribution Data Guide" listing publications and reports of significant interest in the field of distribution.

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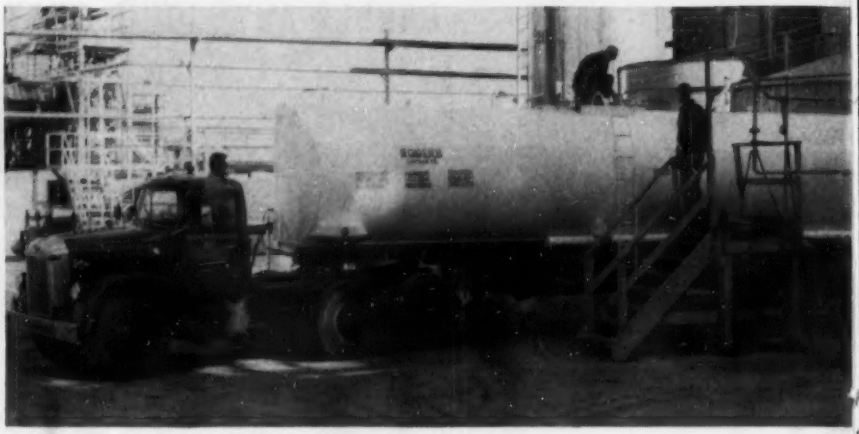


NEW ACID TRAILER: Two compartments give double service as Victor emphasizes . . .

Shipping Bulk by Truck

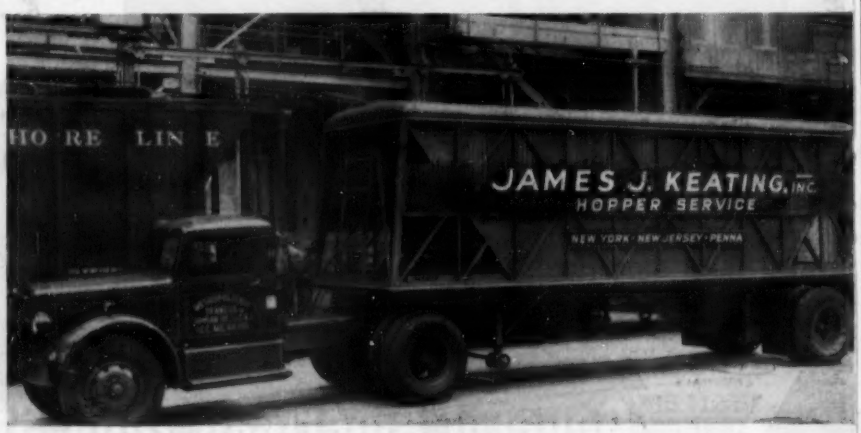
"One of the most important functions of a traffic department is that of helping the sales department achieve better distribution of the company's products."

Backing his statement on company service, Walter Saaby, director of traffic for Victor Chemical, this week disclosed his latest plans for streamlining his company's transportation setup.

Ready to Roll: Two separate moves mark Victor's recent transportation operations. In the East, it has now set up bulk-by-truck distribution of sodium tripolyphosphate from its Morrisville, Pa., plant—a new service that has a potential coverage of all Eastern Seaboard points, and is gradually being expanded according to customer demand. Up to the present, special hopper trucks (*see cut*), capable of delivering up to 40,000 lbs. of tripoly, supply New York and New Jersey customers.

Saaby concedes that there may be a slight disadvantage to a customer interested in gearing his receiving facilities to handle truck delivery: it might cost him a few thousand dollars to adapt his operation. But, claims Saaby, the possible long-term savings in labor, time and money might well make the switch worthwhile.

As its second transportation move, designed to benefit its Midwestern customers, Victor will now ship phosphoric acid in a new two-compartment tank truck from its Chicago Heights plant. Claimed to be the first tank truck of this type, the trailer has two domes, two compartments, two outlets and a double (for safety) bulkhead between sections. Each stainless steel tank section will hold 3,000 gal., is insulated to prevent the 85% phosphoric acid from "freezing." The two tanks can be unloaded simultaneously and can be emptied by gravity, air pressure or pump.



"HOPPED-UP" SERVICE: East Coast gets quicker delivery as Victor trucks.

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Two Ammonia producing plants recently placed "on stream" and four more are in various stages of design and construction. These six plants have a rated capacity of **1000 Tons per day.**

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Titre	40 to 43°C
Acid Number	200 to 205
Iodine Value	40 to 60
Saponification Value	201 to 206
Color (5¼" Lovibond)	Max. 40Y/4.0R

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Discussing the Victor switch-over, Saaby contrasted the old and new arrangements in this way:

- Victor previously shipped phosphoric acid in a single-compartment, 3,000-gal. truck. Result: customers using both 75% and 85% acid had to contend with two separate deliveries.
- With the new truck, a single delivery can supply customers with both concentrations.

Cutting Corners: Traffic man Saaby has been beaming much of his efforts at improving the lot of the between-size buyers. He's been trying to cut costs and speed handling. At the same time, he has been investigating ways to offer less-than-carload purchasers the savings of bulk freight. One answer, he is convinced, lies in the use of trucks such as Victor is now employing.

Pains and Gains: Saaby points out that while most trucking lines have ICC permits for petroleum products, bulk chemical handling is still in its infancy. On more than one occasion Victor has gone to bat for the truckers and helped them obtain permits for a particular chemical commodity.

But, Saaby feels, the effort in lining up trucking permits is well worth the time and money expended, points to these sales-service advantages:

- Faster delivery time: a truck can get a bulk load to the customer's door in double-quick time.
- Better inventory control: the smaller user located in the short-haul truck area can take advantage of the lower bulk rates without bothering with carboys or drums. There's no container deposit to bother with, no return shipment of empties. Inventory can be held down since delivery can often be made the day the order is placed.
- Lower freight rates: Victor estimates a savings of approximately $2.50/cwt. when the customer takes 75% phosphoric acid in bulk truckloads rather than in drums.

Just Starting: Director of Traffic Saaby emphasizes that the entire program is really just starting. He feels that his department's work doesn't end with lower transportation rates, is convinced there are many ways he can work with other Victor departments to give the customers better service.

Indicative of future expansion: right now Victor has an application before the ICC on behalf of a trucking firm for hauling a chemical that has never moved in bulk by tank truck before—indicates that if necessary to get the bulk hauling permit, Victor will go into the trucking business as a sideline.

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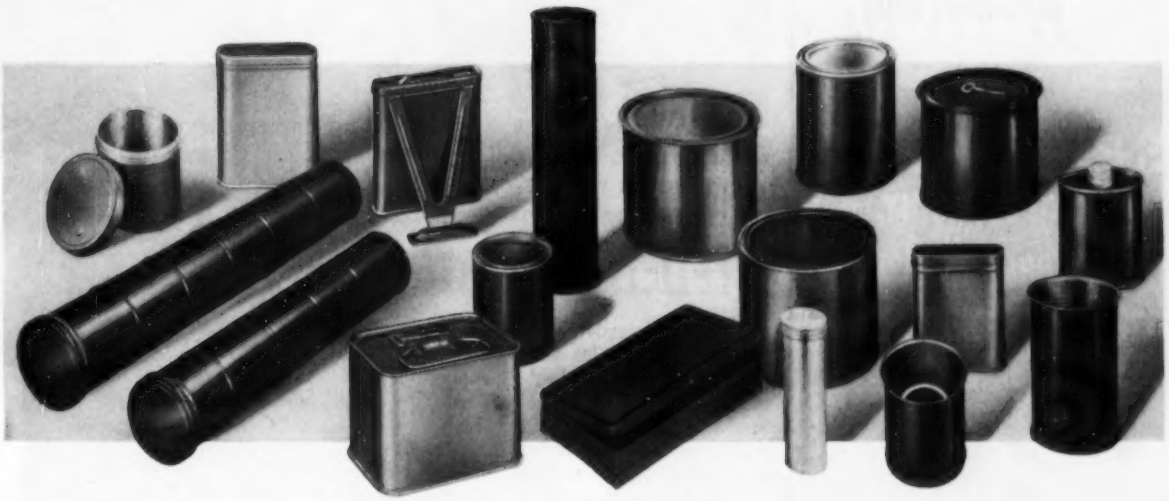

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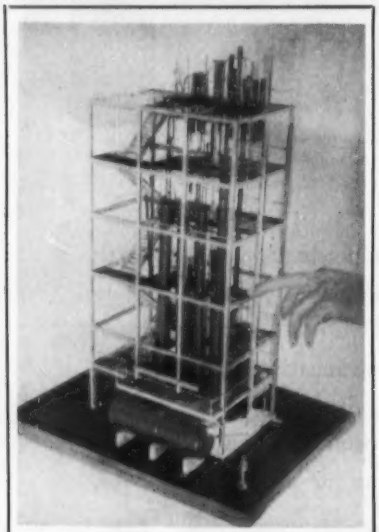

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CERTIFICATE WINNERS: Match books picked as best of chemical field's . . .

Striking Salesmen

Certificate awards went to seven chemical companies this week as a panel of outstanding leaders in advertising selected the companies' match books as best in their field among nearly 300,000 American business concerns using the medium last year.

Geigy Agricultural Chemicals Div. took top honors, its pocket-size salesman being voted "the most distinguished use of match book advertising in the chemical industry in 1953."

Geigy's winning entry won the judges' choice for the extraordinary eye-catching value of its black-and-yellow cover displaying the company logotype. Judges stressed the merchandising value of listing sales office locations on the reverse side of the cover, and listing products inside.

Road Scratcher: The Solvay Process Div., Allied Chemical & Dye—one of seven certificate award winners—had one of the most unusual covers of the chemical entries. To promote Solvay calcium chloride for highway de-icing, the company combined matchbook safety with highway safety themes. The friction strip for lighting the matches is a cleared stretch of roadway on the back cover.

Other certificate winners in the chemical industry: Van Straaten Chemical, for good cover design; Koppers, for dignified over-all effect backed by an inside-the-cover message; Dewey & Almy, for good use of inside cover; Royce Chemical, for excellent cover design; Spencer Chemical, for good design and promotional punch, and Godfrey L. Cabot, for cover impact.

Special Containers: Cabot is among the companies contending in the packaged match-book category, is distributing its match books in small-size facsimiles of a new type of printed carbon black bag, which it has been sponsoring.

GEIGY COVER: Plaque winner.

THE ECONOMIES OF 73% CAUSTIC SODA SOLUTION are no longer reserved for the largest users . . . lower shipping costs now make it the best form for you, too.

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FAST, DEPENDABLE DELIVERY of uniform 73% caustic solution is assured through use of Dow-owned tank cars. These 8,000- and 10,000-gallon cars are insulated, protectively lined, and fitted with nickel heating coils; unload from top or bottom by air pressure or pump. Frangible discs, protective plug cocks are two of the advanced safety features.

How long has it been since you have checked your caustic buying habits in the light of increasing cost factors? Higher freight rates are erasing the savings in 50% caustic solution for more and more users every day. Even users located near shipping points save money with 73%, since the higher price of even shorter distance hauls quickly wipes out the price difference between 73% and 50%.

73% caustic must be diluted when received, but most caustic users dilute 50% solution, too. The cost of additional handling equipment for dilution, when fairly amortized, becomes a small item in comparison to your over-all cost reduction.

If you are still buying 50% caustic solution, discussion in your plant and consultation with our Alkali Technical Service is indicated. Perhaps the comprehensive Dow Caustic Soda Handbook can help you in preliminary discussion. Ask your Dow sales representative for your free copy or write to THE DOW CHEMICAL COMPANY, Dept. AL 901B, Midland, Michigan.

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➔ **This year, the chemical industry plans a capital expenditure of approximately $1.3 billion.**

➔ **Roughly 10% of that, or about $130 million, will be spent on piping, valves and fittings.**

➔ **But the temperature and pressures involved mean that the bulk of this—probably 85%—will be filled by metals.**

➔ **That leaves 15% open for special materials of construction—a $19-million market that's . . .**

. . . Fair Game for Plastics

But the season has barely begun; for fabricators have shied away from chemical plants as an outlet for their wares.

What they need is more data on plastics' behavior, a sound program on standards, better fabricating techniques.

A raft of new firms are stepping in to supply these. Here's a rundown on the chemical industry as a raw material supplier and a potentially big customer for plastic pipes and fittings:

You can't put a yardstick on all the plants in the chemical industry to measure their exact potential as customers for plastic pipe and fittings. But with the aid of a slide rule, some specific data, and a few estimates, you can come up with a pretty good idea of the order of magnitude (*see above*).

The truth of the matter, however, is that at the moment, plastic equipment of any sort is the exception rather than the rule in chemical plants, principally because fabricators have, for the most part, steered clear of the field. Instead, they've concentrated on more lucrative, less demanding applications elsewhere.

But plastics afford the design engineer a larger variety of materials of construction, could be a valuable weapon in the fight against corrosion. And plastic fabricators can be expected to make the most of that when they start to drive for chemical markets. They should get a warm reception from the chemical industry, which picks up more than its share of the annual $5½-billion corrosion bill.

Ready to Serve: Before plastics rate serious attention as contenders for honors as materials of construction in the chemical industry, however, molding companies have a lot to learn. They've got to get more comprehensive data on the behavior of their products under varying conditions; they've got to adopt a sound program on standards and they've got to learn fabricating techniques that will turn out uniform products at low prices.

Though these obstacles loom large, there's no lack of new firms entering the field with the hope of surmounting them. They're responsible, reputable outfits, moreover, many of whom are bringing experience from other industries that should benefit both the industry and its customers. Crane Co., for example, the big Chicago valve maker, is quietly conducting pilot-plant studies on injection molding of fittings. It's investigating most of the commonly used plastics, including styrene, Tenite butyrate and polystyrene. Actually, says Crane, the goal of the studies is to determine just what position it should shoot for in the industry, whether it should be a manufacturer or merely a distributor.

And just two weeks ago, Borg Warner, whose biggest customer is the automotive field, established a subsidiary that will supply fabricators with a styrene resin containing small amounts of polymers of butadiene and other materials.

Minnesota Mining & Manufacturing has acquired Gustin-Bacon Manufacturing's patents on glass-reinforced plastic pipe, is cooperating with the latter on research and development. Currently, 3M, like Crane, is conducting pilot studies, has not yet decided on what resin it will employ and whether to make the fittings as well as the pipe or merely the fittings. In any case, the resin will not be a polyester, will more likely be a fluorocarbon. As yet, the firm has had no pipe for sale, but it expects to have some ready before the year is out.

Three of the big rubber companies, moreover, are exhibiting a more than casual interest in the fabricating end. Next week, stockholders of General Tire are expected to approve the purchase of The Bolta Co. of Lawrence, Mass. (along with Textileather). If the deal with Bolta goes through as planned, General will occupy a prominent position among fabricators of polyvinyl chlorides. Bolta turns out a fairly complete line of pipes and fittings, lays claim to being the leading molder of rigid PVC in the country; its products are distributed by H. N. Hartwell & Sons (Boston).

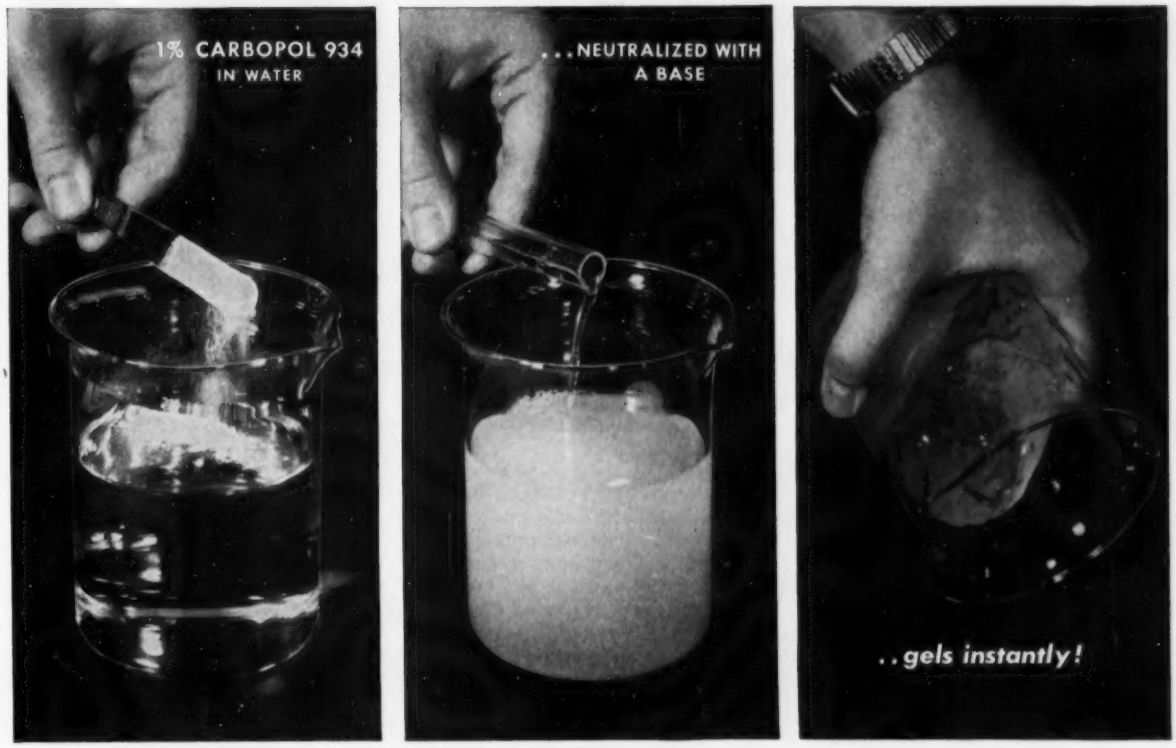
U. S. Rubber has been making pipe and other structural shapes from its Kralastic resin (a copolymer of styrene, butadiene and acrylonitrile). Now it's also making rigid PVC pipe, is presently hard at work ironing out some of the fabricating wrinkles. And B. F. Goodrich, which has been supplying PVC to molders, also is now a fabricator of PVC pipe.

Eagerness to get into the field isn't confined by any means to raw material suppliers. Republic Steel, for example, bought out Owens-Sharpe, Inc., last summer (*CW, July 11, '53*); its pipe division is now making polyethylene and Tenite butyrate pipe, also fittings. Youngstown Sheet and Tube Co. bought the major interest in the Perrault Bros. glass-reinforced plastic-pipe business. It's now operating as the Fibercast Division; distribution is being handled by regular Youngstown subsidiaries. And some time ago, Van Dorn Iron Works, Cleveland's big maker of jail bars, started making rigid PVC equipment. It started out doing custom jobs only but is now offering a line of rigid PVC pipe and fittings with the exception of valves.

Also last summer, Continental Can took over Elmer E. Mills. It wasn't until the first of the year, however, that the latter's plastic-pipe operations were brought into the family. They're now being carried out by the

Another unique, new development from

B. F. Goodrich Chemical



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Mills Plastic Pipe Division of Continental Can, which makes pipe from most of the resins that have been popular for that application.

Add to these the others that have been firmly entrenched in the field and you get an industry made up of over 50 molders all jockeying for position. Because of the competitive nature of the business, it's impossible to rate the field in order of size, but certainly two Ohio firms—Carlon Products, Cleveland, and Yarley Plastics, Columbus—rate as two of the biggest.

For the Plant: The same competitive nature makes it virtually impossible to get any reliable figures on the present and potential production of the various types. And because so little work has been done on applications for chemical plants, it's impossible to separate the future of pipe in chemical plants from the over-all future of plastic pipe. Here, however, is a quick rundown on the present and potential status along with some of the assets and liabilities of the resins that will make them succeed or fail as materials of construction:

• Polyethylene. Best guess is that plastic pipe consumed about 15% of the 135 million lbs. of polyethylene produced in 1953. It's far and away the most popular pipe made today, probably accounted for 70% of all the plastic pipe made last year. Though it's due for a steady increase in production, it will probably lose ground percentagewise to some of its faster-moving younger bretheren. In 1954, it may account for only 60-65% of total plastic-pipe production. Well known assets are its relative low cost, its light weight and resistance to corrosion.

Little of this pipe, however, was used for tough chemical applications. Its tensile strength is not so good as some of the others, and its biggest future probably lies in fields other than the chemical industry.

• Tenite cellulose acetate butyrate. In an easy second place last year was Tennessee Eastman's Tenite—molded by a number of fabricators. It's transparent, is not too expensive and should increase in volume next year and hold onto at least its current share of the market (which is estimated at between 10-15%). Its general corrosion resistance is good, but it does not seem suitable for really tough jobs involving strong acids, strong alkalis or organic solvents.

• Kralastic styrene copolymer. Volume of Kralastic pipe made last year probably amounted to 7-8% of the total. U.S. Rubber, however, which makes the resin and fabricates it too, sees a big jump for it next year. The firm is bringing in additional resin capacity next July, which should triple the output. It thinks that Kralastic pipe should push—or even edge out—butyrate for second place next year. Like polyethylene and Tenite, it's handled by most of the big fabricators.

Its chemical resistance is good, but a full evaluation of its role in chemical plants must await more performance data.

• Vinylidene chloride (Saran) and polyvinyl chloride accounted for the bulk of the remaining 8-13% of the plastic pipe made last year. Most of the Saran pipe has been made by Mills and American Hard Rubber (under Dow license). It is not, however recommended for handling strong alkalis, aromatic and chlorinated solvents.

Polyvinyl chloride is the dark-horse candidate for most useful plastic in chemical plants. It enjoys wide popularity on that score in Europe; but it's too new in this country for a valid estimate of its merit. It has, however, excellent resistance to some chemicals, particularly oxidizing agents like sodium hypochlorite, and to chlorine and several of the strong acids. On the other hand, it doesn't seem suitable for many organic solvents.

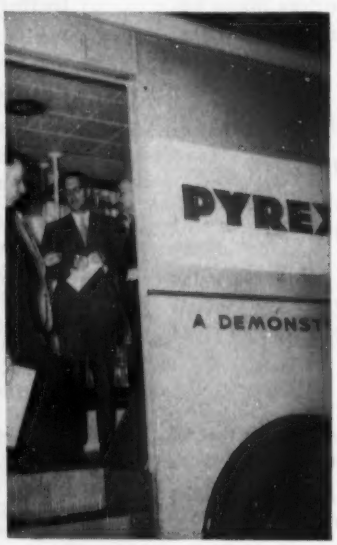
A number of firms started to mold rigid PVC several years ago (*CW, Nov.* 17, '51). But there are still problems to be solved on fabricating it. Carlon, for example, got an early shipment of raw material, found it unsuitable and temporarily abandoned the idea. Since then, it has renewed interest in the material, but says there's still considerable ground work to be done.

• Reinforced polyester: The glass-reinforced pipe has been the glamor child of the industry. But present production is extremely limited. The extent of its potential for handling corrosive chemicals is still a question mark.

Presently, Youngstown is further along with glass-reinforced polyester pipe than anyone else. It figures that the oil industry is the primary target for the product but thinks the chemical industry is a lucrative—if secondary—one. It says its pipe will probably stand up under chemicals better than some of the earlier versions because of the firm's unique centrifugal casting process. Currently the pipe is not recommended for strong alkalis, but Youngstown feels that different resins may improve the pipe on that score.

Fluorocarbons and reinforced-fluorocarbons are also attractive possibilities for use in chemical plants. Resistoflex Corp. (Belleville, N.J.) recently stole a march on the field by introducing a glass-reinforced Teflon fluorocarbon pipe.

When and if the day arrives that plastics are accepted materials of construction in chemical plants, it will put the industry in an unusual position, for the plastics industry is one of its best customers. The chemical industry may turn out to be one of its best customers' best customer.



Glass Hits the Road

ONE OF THE MATERIALS that plastics will have to contend with is glass (which is only excluded from the plastics category by convention). Plugging its Pyrex brand double-tough glass pipe, Corning Glass Works staged a "road show," put a van on a nationwide tour of plants last fall, exhibiting Corning wares and what they can do. One theme that the firm plugs for its glass pipe is that the material is not, as popularly conceived, brittle. To make their point, Corning engineers use a glass pipe to drive a 10-penny nail into a block of wood. The firm is also making the most of glass's excellent resistance to chemicals and the fact that it won't contaminate the product being handled.

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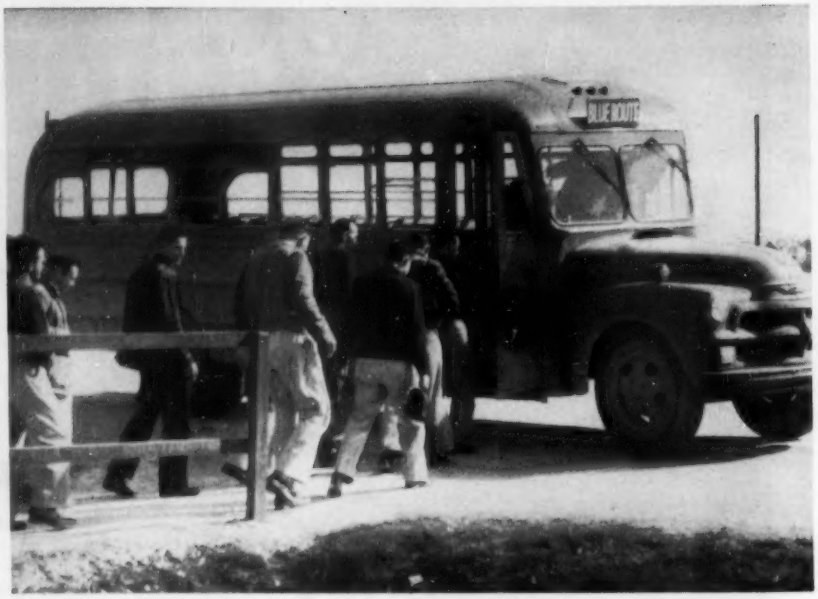


INTRAPLANT BUSES, running on schedule, move 2,800 Dow workers a day.

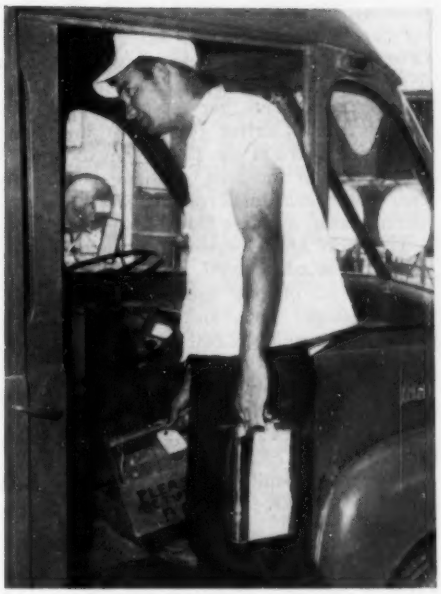
Pickup in Freeport

Saddle-weaned Texans weren't surprised when dudes from Dow Chemical Co. ran into trouble riding range on 1,200 acres at Freeport. But scraggly eyebrows were raised when the Longhorns glimpsed the chemical industry's ingenuity, saw how Dow solved its transportation problem.

Employing 6,000 people and spread out over 1,200 acres, Dow's Freeport (Tex.) works is concentrated principally in two sites six miles apart. Moving men, materials and products between these two points was only part of the problem. Supplies and personnel also had to be carried to and from outlying, irregularly supplied sites off the beaten track. It was a big job, and Dow wanted it done fast, efficiently and at minimum cost. The assignment fell to the Motor Transportation Dept.

Motorized H.P.: Substituting wheels for horses, M.T.D. took a quick look at the Dow spread, figured it could

MAIL VANETTES are on timetable between mail rooms and plant.



LIGHT VANS make "flag" pickups.

ride herd on most of the 6,000 head as well as any Texas cowpoke. The first step was setting up a regularly scheduled service for all operations that could be timetabled:

- Transportation of plant workers to and from shifts, while a major undertaking, was one of the easiest to schedule. Today, M.T.D. operates six intraplant buses (*top left*), carries 61,500 riders 15,000 miles/month.
- Delivery of mail from two central offices to over 90 different plant locations is handled daily by specially equipped vanettes (*bottom*).
- A daily pickup and delivery route to and from Houston was set up; interplant shipments were timetabled, handled by both light and heavy vans; interplant taxi service for personnel was organized, put on a definite schedule.

Flag Service: Offbeat transportation to and from remote, irregularly supplied sites proved more of a problem. When possible, M.T.D. decided, all spot requests for pickups and deliveries would be funneled through two central dispatch offices, scheduled for whatever transportation happened to be heading next in that general direction. In many instances this proved inefficient and time-consuming: one truck might have just left for the same area the request came from; sending another out right away would mean double tracking over the same route, while waiting for the next scheduled departure might interrupt a vital operation.

Taking a lesson from neighboring

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PRODUCTION . . . .

fishermen, M.T.D. decided to use flags for the offbeat, nonscheduled spots. Often referred to, in fact, as a "shrimp flag,"* the fluttering topmasted white banner signifies another service stop to any M.T.D. driver (*page 57*) in the vicinity. When the flag is down, drivers bypass the area, continue on their closely scheduled route. It works like a charm, declares Dow.

The entire M.T.D. operation, scheduled and nonscheduled, says Dow, seems to be proving itself out. Not counting night shifts and weekends, buses are carrying 2,800 passengers every day; taxis, 200 a day. More important than movement of workers is the movement of material; there are nearly 800 inter- and intraplant shipments a day. Efficiency? Including everyone from janitors to supervisors, the entire M.T.D. numbers only 178.

EQUIPMENT . . . .

Pressure Monitor: Designed for use with any two- or four-arm strain gauge transducer and standard oscilloscope, Control Engineering Corp.'s (Norwood, Mass.) new pressure monitor is claimed to give accurate, calibrated readings of any dynamic pressure. The unit can be read directly in psi. or scaled to percent of transducer output.

•

Fast Close: Kieley and Mueller, Inc. (Middletown, N.Y.) is introducing its new three-way, cylinder-operated proportioning valve. K & M underscores the units' high travel and speed on both the pressure stroke and spring return. Full travel with tight shutoff can be effected, says K&M, in half a second, provided there is less than 100 psi. on the cylinder; spring return takes about the same time.

•

Traveling Clinic: On April 15, Chicago will play host to the third in a series of five traveling materials handling clinics sponsored by The Material Handling Institute. While the last clinic is only indefinitely scheduled for an up-state New York industrial center, the fourth clinic is definitely slated for Montreal on May 10.

•

Ultrasonic Viscosimeter: Ultrasonic Engineering Co. (Maywood, Ill.) is adding three new viscosimeters to its line of ultrasonic products. Claimed to provide instantaneous, accurate and continuous measurement, the instruments feature a rugged probe, which is inserted in any liquid, gives readings in centipoises times density. The unit, says UE, will operate at elevated tem-

* For Texas fishermen, the white flag signifies live shrimp.

peratures or under heavy pressure, will measure viscosities ranging from zero to 100,000 centipoises.

•

Centrifugal Pump: Higher efficiency at lower cost is the way Heinicke Instruments (Hollywood, Fla.) is billing its new line of stainless steel and Monel Hydro-Ram centrifugal pumps. Available in ½-, ¾, 1- and 1½-hp. models, the pumps feature a new impeller design and mirror-finished parts—attributes that, claims Heinicke, increase efficiency by decreasing friction and turbulence losses.

•

Pressure Transducer: North American Instruments, Inc. (Altadena, Calif.) recently extended its line of Northam variable reluctance-type transducers through addition of the model GP-8 high-range pressure transducer. Said to be suitable for both static and dynamic measurements, the instrument is available in sizes ranging from 200 to 5,000 psi. gauge.

•

Paper Trainer: For those companies with a need for personnel trained in servicing electronic equipment, Van Valkenburgh, Nooger & Neville, Inc. (New York) now has available a training device, Trainer-Tester, which will eliminate the need for expensive training equipment. Trainer-Tester is, in effect, a printed form that presents the trainee with a series of problems in trouble diagnosis and circuit tracing similar to those encountered in actual electronic equipment.

•

Flexible Cooler: Based on a refrigerated water cooler less than 1 ft. high, its new cooler, says General Electric Co. (Milwaukee), easily can be increased in size, is ideal for any X-ray film processing operation that may vary in volume. Units will cool 40 gal./hour from 85 to 65 F, can be stacked atop each other to a three-high maximum.

•

Quarter Turn: A quarter-turn of the control button, says maker Jones Motorola Corp. (Stamford, Conn.), allows its new hand tachometer to switch between RPM ranges 50-500 and 500-5,000 when making measurements on revolving shafts. Substitution of a disc for the instrument's RPM tip enables the unit to measure moving surfaces in feet per minute. Price for tachometer and accessories: $62.

•

Five on One: Latest offering from Central Research Laboratories, Inc. (Red Wing, Minn.) is the model HC-101 high-temperature X-ray diffrac-

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PRODUCTION. . . . .

tion powder camera for those interested in powder production, control or research. Use of the camera enables the operator to obtain five separate diffraction patterns on one film.

•

Sealed Seals: Stillman Rubber Co.'s (Culver City, Calif.) new automatic packaging machine is designed to seal rubber O-rings in individual, stamped envelopes meeting government packaging specifications. The machine, perfected by Stillman engineers, eliminates time lost in hand sealing, protects the rings from handling and contamination. Part number, date of manufacture and other pertinent data are printed on the envelopes, facilitate storage and inventory.

•

Glassy Bonnets: Pfaudler Co. (Rochester, N. Y.) is now working on a special heat exchanger under order for a New York chemical firm. Made of Hastelloy C with glassed-steel bonnets, the unit will see service as an evaporator for monochloro-acetic acid. Says Pfaudler: use of the glassed lined bonnets in place of Hastelloy is cutting cost considerably; combination of glassed-steel and Hastelloy is expected to provide complete corrosion resistance.

•

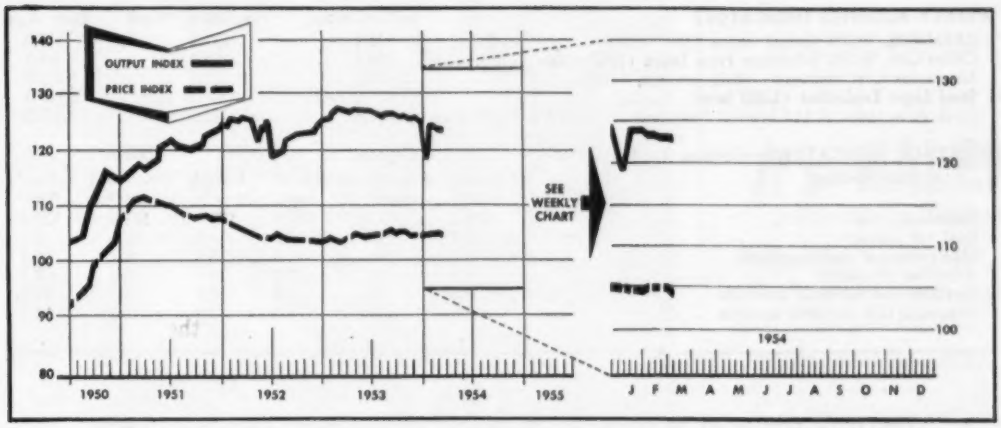
Potbellied Pipe: Developed through the joint engineering efforts of Aluminum Co. of America (Pittsburgh) and Hercules Powder Co. (Wilmington, Del.), a new-type aluminum pipe is now being offered by Alcoa to chemical men needing heated pipelines.

The pipe, extruded as a single unit from Alcoa 3S-F aluminum alloy, is described as a steam-traced aluminum pipe that provides a new approach to the problem of applying heat to product piping. In place of conventional external steam jackets, the new pipe features an integrated steam line—similar to the cargo-carrying belly-packs of airplanes—running along underneath and distinctly separated from, the product line.

Somewhat similar in cross-section to the No. 8, the pipe is tradenamed Unitrace. It should, feels Alcoa, find ready acceptance by those chemical producers handling tars, pitch or solutions such as ammonium nitrate, which require heated lines to keep the products from solidifying or crystallizing.

•

Flow Meter: Builders-Providence, Inc. (Providence, R.I) is now on the market with a new device, the Dall flow tube, for measuring flow rates of liquids and gases.



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Marketplace activity currently centers on a rash of price changes. That the second quarter would usher in some significant reductions had been, of course, presaged by the relatively sluggish movement of chemicals during the first quarter of the year.

•

It's no news that most sellers have been deep in huddles of late, pondering the extent to which certain prices should be cut; but not many customers were prepared for late last week's glycols and ethylene oxide paring. Reason for the surprise: Similar reductions posted only a few months ago (CW Market Letter, Dec. 19, '53).

Imminent outpouring (later this month) of ethylene, diethylene, and triethylene glycols from Allied Chemical's (Nitrogen Division) spanking new plant at Orange (Tex.), may be partially responsible for the trade's 3¢/lb. across-the-board reduction. (Capacity of the $5-million installation is, reportedly, some 40 million lbs./year.)

The recent warm weather-depressed demand for permanent antifreeze, however, is a weighty factor in the slackening of the gycol take.

Stepped-up output is behind the lower ethylene oxide price, which is now 13½¢/lb. (tanks). The reduction, as could be expected, pressured ethanolamines. Mono-, di-, and triethanolamine producers by this week are all quoting the same 3¢/lb. cut.

•

It hasn't happened yet, but don't be surprised to see a lower price tag on titanium sponge—and soon. Trade talk has it that the raw material price will follow the recent drop of some fabricated titanium.

Recently the government upped—to 35,000 tons—the industry's capacity goal. But in the light of current slackening of the military's titanium take, and the time necessary for new production facilities to roll, U. S. output may well crawl—not leap—toward the new target.

•

A just-announced decision is ominous for makers of some herbicides. Despite general acceptance of 2,4-D as a broad-leaf weed killer, a

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	123.4	123.3	127.0
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.3	104.3	104.1
Bituminous Coal Production (daily average, 1,000 tons)	1,125.0	1,157.0	1,373.0
Steel Ingot Production (1,000 tons)	1,621.0 (est.)	1,624.0 (act.)	2,190.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	272.4	273.2	260.0

MONTHLY INDICATORS—Foreign Trade (Million Dollars)	Exports			Imports		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	$64.2	$82.3	$57.4	$23.0	$21.9	$21.4
Coal tar products	4.2	6.1	3.9	4.4	2.6	2.6
Medicinals and pharmaceuticals	15.7	20.5	13.6	0.8	0.7	0.3
Industrial chemicals	9.2	10.8	9.7	4.4	6.4	6.0
Fertilizer and fertilizer materials	3.6	5.0	2.4	10.7	8.7	11.0
Vegetable Oils and fats, inedible	3.8	7.2	1.7	7.2	6.8	6.5

hearing—requested by cotton growers in a seven-county corner of Texas (CW, March 13)—has resulted in an order banning the hormone herbicide's use in that area.

The prohibition for the first time invokes authority of the Texas Herbicide Law, primarily hits crop spraying operations of rice growers. Agriculture Commissioner John White's statement, however, recommends use of 2,4,5-T instead of 2,4-D. The former is a similar hormone-type herbicide that is an equally effective weed-killer but in only a tenth to a fifth as damaging to neighboring cotton plantings.

What has 2,4-D makers and formulators worried—and working to products of lower volatility—is this: the ban could conceivably spread to more Texas counties, as well as to the seven or eight other states that have herbicide application regulations on the books.

•

A stalemate—this time over foreign copper—may be nearing an end. Word out of Washington late last week is that the U. S. will buy some 100,000 tons of surplus Chilean copper for the stockpile.

Details as to deliveries and prices haven't been worked out yet, but the most frequently heard quote is about 30¢/lb., the current world price. That, in essence, confirms the long-standing indication (CW Market Letter, Aug. 15, '52), that Chile would unload a substantial chunk of its copper accumulation here, and not at its previous, stubbornly held 35½¢ figure.

•

In another section of the nonferrous metals market, lead producers are again cautiously nudging prices higher. Added to the two recent increases (CW Market Letter, Mar. 20), are two more gentle ¼¢/lb. rises. If the sudden perk in demand continues, chances are makers may hike prices still further above the present 13½¢/lb. tag.

Scoring similar advances were the oxide pigments, dry red lead, litharge, orange mineral—and an indication that paint makers are stepping up their purchases, getting ready for an expected seasonal boost in business.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending March 29, 1954

DOWN

	Change	New Price		Change	New Price
Glycols, dms., c.l., dlvd. E.			Ethanolamines, dms., c.l., dlvd. E.		
diethylene	$ .0225	$ .15	di-	.03	.2475
ethylene	.03	.1325	mono-	.03	.2675
triethylene	.02	.2125	tri-	.03	.2325

All prices per pound unless quantity is stated.

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No Pinch on Borates

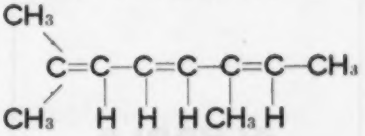
The borax industry—and particularly its boric acid segment—winced a couple of Sunday evenings ago when a prominent newscaster "confirmed" (to Mr. and Mrs. North America and all the ships at sea) his previous "warning" to mothers that baby powders and ointments containing boric acid should not be used.

There's a big question, however, whether or not that caution was necessary or prudent. Two recent U.S. Food & Drug Administration statements, one in September of last year, the other issued in late January of this year, plus continuing industry and medical research and investigations, indicate strongly that boric acid as used in baby products is safe. The findings tend, too, to discredit a so-called "campaign of propaganda" against boric acid and borated baby powders allegedly sparked by a manufacturer of a nonborated product.

A Century of Climb: The current clash serves to turn the spotlight on a hoary, well-established business that had its beginnings in the U.S. nearly a hundred years ago. Borax was discovered in California in 1856, but it was not until 1864 that domestic production was first recorded. That year the fledgling industry produced all of 12 tons.

Today, though it's well-nigh impossible to pinpoint output figures, one

Know What This Is?



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"guesstimate" pegs domestic production of boron minerals and compounds* at roughly 600,000-650,000 tons/year. That amount, in terms of the common denominator, boron trioxide (B_2O_3), approaches an impressive 400 million lbs. annually.

And note this eyebrow-lifting fact: about 95% of the domestic and 90% of the world's borates stem from only two sources in southern California—the brine of Searles Lake (San Bernardino County), and kernite (rasorite) ores mined near Boron (Kern County).

At the present time, the refineries of Pacific Coast Borax at Wilmington (Calif.), and of American Potash & Chemical at Trona are the largest in the world. The former company—which accounts for perhaps 60-70% of total borax output—mines and refines the crude ores; the No. 2 producer, American Potash, recovers borax from the Searles Lake deposits. Operations involve separating it from a brine of complex chemical composition made up, hypothetically, of about 3% borax; the balance is water and numerous soluble salts of sodium and potassium.

Lesser quantities are contributed to the borax pot by other California-based installations, including those of West End Chemical and Columbia-Southern.

There are, and have been, other sources of borates throughout the world, but the U.S.—with its ample reserves of raw materials and modern production methods — years ago usurped top spot as the world's supplier. Graphic example is this comparison of Chilean vs U.S. production during the late '20s. By 1925 Chile's crude borate output reached a maximum of some 40,000 tons. Four years later production had skittered to about 4,700 tons.

Meanwhile U.S. production of crude and refined material jumped from 164,000 tons (1925), to more than 260,000 tons—plus 11,600 tons of boric acid—by 1929.

Exports: Big Booster: Prior to World War II, Britain and Germany were the most important export markets for the made-in-U.S. borates. The Reich took as much as 50,000 tons of crude and refined borax a year and—as did England—re-exported substantial quantities. Japan, France, Belgium, among others, too, were no small-lot buyers.

A skip down available export figures underscores the war's market-slicing. In 1937 about 150,000 tons of borates (of the near-359,000 produced here) were sold to foreign customers. By 1943 exports had dropped to a low 26,800 tons.

During the 1940-45 period, however, U.S. turnout fell off somewhat; but the dried-up foreign markets were not the only cause. The porcelain enamel industry, normally one of the largest borax outlets (see end use pattern), practically ceased to exist during the war years.

How the industry bounced back, faltered during the "recession" of '48, and then resumed its climb is evident when comparing some production data since 1943.

U.S. Borates Output
(thousand tons B_2O_3 content)

1943	87.6
1945	104.6
1947	145.7
1948	134.7
1949	139.2
1950	191.0

Domestic consumption of borax slumped, reached its lowest postwar

* Includes borax, anhydrous sodium tetraborate, kernite, boric acid, colemenite.

U.S. Borate End Use Pattern*

Glass (containers, fiber glass, etc.)	25%
Ceramics (porcelain, glazes, etc.)	25%
Starch and adhesives	5%
Soaps, cleaners (detergent, etc.)	4%
Agricultural (herbicides, plant food, etc.)	3-5%
Rust inhibitor (antifreeze, water systems, etc.)	3-5%
Others (pharmaceutical, leather, photographic, textiles, oxidizer, asphalt emulsion, paint, etc.)	30-35%

* Figures are approximate.

In our continuing study of
isobutyraldehyde as a basic chemical raw material,
we are pleased to announce the publication of

The Chemistry of Isobutyraldehyde and its Derivatives

by HAGEMEYER AND DECROES.

For your convenience in evaluating this new treatise as a reference manual in your daily work, we have reproduced here the table of contents.

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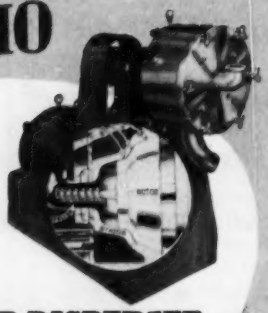

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ebb during 1948. Increasing export tonnages, however, offset this decline to some extent. For instance, U.S. sellers, by the following year, were shipping out more than three times the 1943 quantities—some 109,500 tons of borates.

The Korean incident, in 1950, delivered another jolt to the borax industry. Supplies, adequate early in the year, had earned a tight label by year's end. The following year—peak for chemicals—saw a 50,000-ton hike in B_2O_3 movement over the previous year. Exports soared nearly 33% higher.

Then came the abrupt "readjustment" of '52. Output dropped from 1951's 241,000 tons to 169,000. Foreign shipments, too, suffered.

Currently, although official figures are not yet available, indications are that production of borates in the U.S. during '53 picked up where it left off in '50, had weathered the abnormal swings of the intervening two years.

Whether or not 1954 will tote up as a banner year is a matter for conjecture. But with men who know borates best, the consensus is: we'll do as well as last year, but if there is a falling off, it'll be slight.

That may or may not be an overly optimistic view of things to come, but this much is certain: if a multiplicity of outlets is any depression-deterrent, then the borax industry is set for a bright future. For although more than half the boron minerals used are consumed in the production of glass, ceramics and glazes, the remainder is scattered among perhaps a hundred or more other uses.

Borax Moves In: Most important ceramic use for borax is—and will likely continue to be—in the manufacture of vitreous (porcelain) enamels for household appliances and accoutrements: kitchen ware, ranges, bathtubs, refrigerators, washers, clothes driers, etc. Recent Washington statistics indirectly underline the American home as an expanding borates outlet. Since the war, the figures reveal, building booms, mushrooming mass-produced housing developments, have converted half the nation's families into homeowners; and one-fifth of those families live in new houses.

That the trend will continue is emphasized, too, by ambitious plans of some refrigerator makers. Despite a current slowdown in purchases, and in some cases, backed-up inventories, not a few are spending heavily on expansions of production facilities.

Newer developments including porcelain-on-aluminum, outer-porcelained steel for refrigerators will be ready

when that now-being-eyed future demand materializes.

And concomitantly will come a stepped-up demand for once-luxury, now regarded as near-necessity items —multiple bathrooms, complete home laundry units, dishwashers, etc.

A Clear Widening: The last two decades have seen the glass industry surge and develop into a top borates consumer. Borax and boric acid are essential raw materials for the borosilicate, heat-resisting glasses. Typical is Pyrex ovenware, basically a boric oxide and silica glass containing 12-14% boric oxide. Borax and boric acid serve as a flux in melting, furnish the oxide to the glass composition.

The borosilicate-type glasses are being produced in an ever-widening variety for both industrial and household use.

Also expected to blossom greatly is the practice of adding some borax to the older-line commercial soda-lime-silica type glass. Many of the desirable borosilicate properties are said to be imparted.

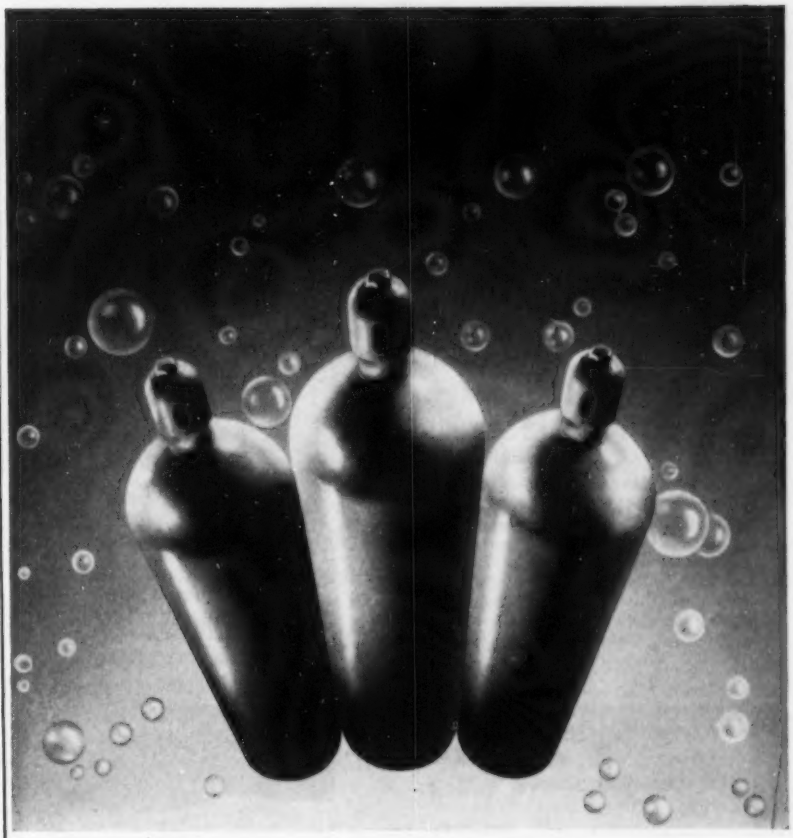
Glass, in this field, has been jostled by tin, paper, and more recently the plastics. Aluminum, and aluminum-plastic combinations loom as future market-grabbers. Borax, enhancing the quality, may well assure glass its position as a topnotch container material despite the bucking.

Enough For All: A complete list of the current and all the potential end uses for borates is practically impossible to compile. One long-time borax outlet, though, has been in the soap and cleaning compound field. To many the term itself conjures up a picture of Pacific Coast Borax's famous Twenty Mule Team trademark.

The diverse borax qualities, of course, have been, and are, the market-opening keys. Its powerful solvent action on metallic oxides is valuable in brazing, soldering and welding; the mild alkaline nature sparked use in the leather industry; it's a fireproofing ingredient for paper, wood, textile products; a fire suppressant for herbicides.

And despite the current charges concerning the pharmaceutical uses, boric acid's mild antiseptic action will likely maintain the product's status as a standard household remedy.

What about the future supply of the borates? Emphatically declares one industry spokesman: "That question can be answered with one word—adequate. "And," he elaborates, "the country's present sources, plus known reserves, will meet all foreseeable needs, at the current demand rate, for many years to come."



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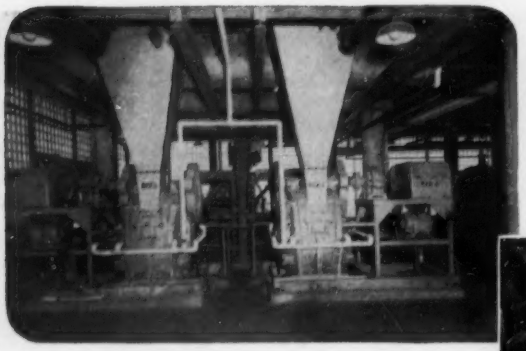

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Chlorine producers may have waxed sanguine over the potential uptake of their product by titanium manufacturers, but they may temper their enthusiasm after a sharper look at the latters' new process choices.

Only a short time ago the Titanium Metals Corp., Henderson (Nev.), became the first major titanium producer to recycle the magnesium chloride produced in the reduction of titanium tetrachloride to titanium sponge. The company decomposes the magnesium chloride, reuses the chlorine and magnesium.

Whereas the near-obsolescent Kroll process consumes about 3.7 lbs. chlorine for each pound of titanium sponge produced, the recycled process calls for only three-fourths pound of new chlorine.

Here's how the new process will affect the titanium-chlorine ratio:

	Titanium (net tons)	Chlorine
1952	1,075	4,300
1953	2,350	8,700
1954	5,100	11,400
1955	7,500	17,100
1956	13,950	33,600

Du Pont, the only other major U.S. producer of titanium sponge, at Newport (Del.), is not near a cheap source of power—hence it does not recycle its magnesium chloride. However, the chloride is sold to magnesium producers.

Soon to follow Du Pont into production is the Cramet Div. of the Crane Co., Chicago (Ill.). Power cost considerations have piqued interest in the Tennessee Valley Authority area, probably near Chattanooga (Tenn.). Cramet envisions pilot-plant trickling by mid-year. Full planned plant output of 6,000 tons may start in two or three years. Chances are the magnesium chloride will not be recycled in early operations.

Depending on the outcome of negotiations with the government, Du Pont may add 7,000 to 8,000 tons to its titanium capacity in the TVA area, too, at New Johnsonville (Tenn.). Operations will probably not begin, though, until sometime in 1957, despite published reports indicating an earlier date.

Union Carbide (Electro Metallurgical Div.) will reach into its own pocket for funds to build a 10,000-ton titanium sponge plant if the government will agree to buy 4,000 tons of the product. In the UC operation, sodium will be substituted for magnesium. Operations may start in 1957.

GE'S LAWTON: Polyethylene, target for cathode crosslinkers.

First to the Tape

Telescope "irradiation" and "polythene" into one word, and you get "irrathene." This week, General Electric's Chemical Division at Pittsfield, Mass., readied its first pilot plant for irradiating polyethylene; and GE's name for the product is Irrathene 101. Experimental quantities of Irrathene 101 tape (.005 in. x 1 in. x 36-yd. rolls) are already available; other grades and sizes of film are under development. These products are expected to find some use in insulation for electrical equipment and for packaging—but a whole deck of other applications is under investigation. In the cards: new heat-resistant, sterilizable containers for foods, drugs, and pharmaceutical products. It's one of the first industrial uses of electron irradiation and could boost even further the multifarious uses of polyethylene plastics.

Shoves Bonds Around: Bombardment of polyethylene with high-energy electrons affects the polymer structure, jolts some of the hydrogen atoms out of the molecules, establishes carbon-to-carbon bonds (crosslinks) between chains, converts the material into an insoluble, infusible plastic.

How much the other properties are affected depends upon the intensity and duration of the irradiation. GE crosslinks lightly, doesn't change flexibility or toughness appreciably but does impart non-melting, non-cracking features.

Normally, polyethylene containing molding flaws tends to crack at right angles to the flaw—especially in the presence of such corrosive media as soaps, detergents, solvents, and acids. Using a crack-resistance test developed by Bell Laboratories, GE tested Irrathene 101 against regular polyethylene in the presence of acetic acid, cyclohexanone, chlorobenzene, a detergent of the alkylarylpolyether alcohol type, acetone, toluene, ligroin, silicone oil, carbon tetrachloride, methanol, or linseed oil. Straight polyethylene cracked after one day in acetic acid or silicone oil. In no case did it survive 100 days' exposure. The irradiated form, however, was still intact after 100 days, regardless of the solvent used.

Under a light load, Irrathene 101 does not melt or flow at temperatures as high as 350 F; at even higher temperatures it will char before it melts. Unfortunately, its strength decreases with high temperatures just like its nonirradiated counterpart; this precludes its use for hot-water piping and similar applications.

Thousands Times Lethal: Heart of GE's irradiation setup is a 2,500-lb. machine for producing high-energy cathode rays (*see cut*). The business end of this device is capable of millions of roentgen units per second. Since fewer than a thousand units are required to kill a man, the unit is heavily shielded with from 2- to 4-ft.-thick concrete walls.

Credit for the discovery of crosslinking polyethylene by irradiation goes to Britain's Dr. A. Charlesby, of the Atomic Energy Research Establishment, Harwell. He used high-energy radiation from an atomic pile in his researching. There have also been studies of this sort in this country. One hitch: pile radiation tends to leave polymers radioactive, is not easily controllable. On the other hand, the energy of the cathode ray may be kept at just the right level and focused on the object to be treated. As a matter of fact GE's technique is suggestive of the methods of deep cancer therapy.

Nineteen Years' Wait: Back about 1925, GE's W. D. Coolidge removed the target from an X-ray tube, allowed the electron beam (cathode ray) to pass into air through a thin metallic window, and studied the effect of this beam on chemical and biological matter. He even polymerized ethylene and acetylene this way.

Interest waned, and it wasn't until the late 1940's that E. J. Lawton and A. M. Bueche at the General Electric Research Laboratory, Schenectady, started a reinvestigation of the influence of cathode rays on the sterilization of foodstuffs and biologicals. At the same time they looked into the depolymerization of cellulose and the polymerization of vinyl monomers. An outgrowth of this work was the observation that irradiation could cause either crosslinking or degradation, depending on the polymer.

Chief among the cross-linkers: polyacrylic esters, polystyrene, polyesters, nylon, polyethylene, chlorinated polyethylene, chlorosulfonated polyethylene, natural rubber, GRS, butadiene-acrylonitrile copolymers, neoprene, polydimethylsiloxanes, and styrene-acrylonitrile copolymers.

Polymers that degrade under the cathode ray include polymethyl methacrylate, polyvinyl chloride, polyvinylidene chloride, polytetrafluoroethylene, polychlorotrifluoroethylene, cellulose, and polyisobutylene.

Many Avenues Open: Just how GE will raise its brainchild, it won't say now. Besides irradiation and sale of its own products, GE may elect to sell or rent irradiating equipment, or even custom-irradiate for outside fabricators of plastic articles. It's too soon to tell.

But one thing is sure: any polyethylene article has to be in its finished form before being irradiated; it can't be molded afterwards.

Once the problem of high cost is licked, irradiation should find application with other polymers, too. Chemists will be hard-pressed to duplicate its desirable effects by other means.

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Lessons in Integration

By dint of their employee training and indoctrinating activities, most companies are squarely in the business of education. Too often, however, it's a scattershot operation, lacking integration and coordination. In 1952 Shell Development Co. faced up to the employee instruction problem, took bold steps toward a solution. A new research personnel training program at the company's Emeryville (Calif.) laboratories, is the result of that effort.

Just over its shakedown year, the new setup makes a good case for unification, consolidates a raft of independent projects to provide training in specific fields. Administered by departments and beamed at both professionals and technicians, these courses cover such subjects as analytical techniques, distillation theory, basic electronics, etc.

Some training cuts across departmental lines. During World War II, there were government-sponsored courses in job relations; later the company began the practice of sending

* Physical chemist Joel Hildebrand.

SAFETY LESSON: Starting point for general orientation.

PUBLIC SPEAKING LESSON: Personal effectiveness, a primary requirement.

out one or two outstanding people for a year of advanced university study—salary and expenses paid. From time to time consultants are brought in to lecture on their specialties; and promising staffers are sent out on special assignments at Shell Oil's Martinez (Calif.), Wood River (Ill.), and Houston (Tex.) refineries.

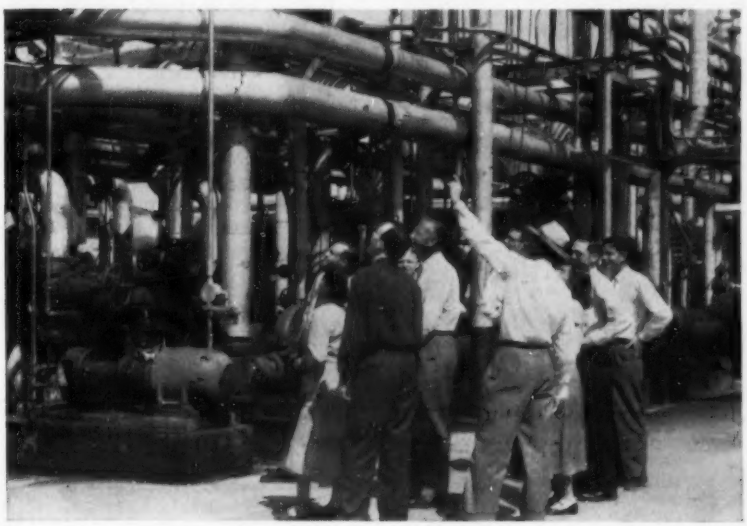
The chemical engineering department provides a tutorial plan—worked out by Vice-Pres. A. J. "Bill" Johnson and associate director Mott Souders, Jr.—under which its members spend two weeks to a month each with a succession of specialists in different fields of chemical engineering.

Companywide training began with safety, has been broadened to include brief general orientation classes.

But, despite consistent increases in instruction activity, the company was steadily losing ground to mounting requirements for more training in a variety of areas. Aware of the need for organization and an integrated plan, Shell started to blueprint a companywide training program, put engineer Peter Gibbon at its head.

A technical man with administrative experience, Gibbon neither researches nor instructs. His job is to assist management by planning, organizing and coordinating the program.

Two guiding principles were laid



PRODUCTION LESSON: For professionals, a follow-up at the refinery.

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down at the start: training would be provided in any field where the need could be justified; trainees would participate on an active, voluntary basis. The immediate objective was to mesh existing training courses, supplementing when necessary; the higher objective is a program adequate for all foreseeable situations, yet sufficiently flexible to meet changing needs.

Gibbon set out by tackling the organization, presentation and expansion of general orientation classes. He soon found himself planning a general course in basic electronics, handling the details of the visiting lecturer program, working out arrangements for new graduate seminar courses and surveying long-term prospects of courses in report writing, rapid reading and conference leadership.

Something for Everyone: Training activities today include a wide range of subjects.

- Nonprofessionals take part in a general orientation series of four one-hour weekly meetings plus a plant tour.
- Professionals take part in a general orientation series of four one-hour weekly meetings plus a plant tour.
- Professionals get a more extensive orientation of 15 weekly meetings. Several months later they get a follow-up course (concluded by a trip to the Martinez refinery) on the company's operations. They also get to hear visiting lecturers, participate in academic assignments, stints with operating and research affiliates, graduate seminars, and public speaking and statistics instruction.
- Chemical engineers have all of the foregoing, plus the Johnson-Souders regimen.
- Management can take part in a training program for technical supervisors and a course in human relations.

One of the brightest spots of the new unified program is the graduate seminar, which comprises an intensive, full-time, two-week course at the Ph.D. level in a field of particular interest. A top-flight scientist presents the subject to a carefully selected group of 15 or 20 researchers.

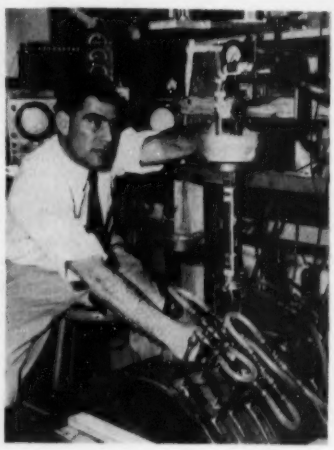
At the first seminar, in October 1952, Joel Hildebrand of the University of California held forth on the theory and structure of liquids; the following January, Yale's Harold Cassidy presented chromatography and ion exchange; last October Michigan's Kasimur Fajans reviewed chemical binding forces; and right now, California's Charles Kittel is discussing solid-state physics. Analogous to Humble Oil's "lectures in science," Shell's seminars differ in that subjects and speakers are chosen not by the staff but by management on the basis of staff suggestions and attendance is selective rather than voluntary.

Clear Fact: As Shell management surveys the new training program after its formative year, one fact is clearly evident: it has been worth the effort.

Here's why:

- The adjustment period for new researchers, it is felt, has been shortened appreciably.
- Applications for optional courses are in excess of capacity.
- Reaction to courses has been enthusiastic, though staffers have voiced occasional criticisms.
- Morale and efficiency have climbed as a result of the improvement in job training.

But in the final analysis, the suc-



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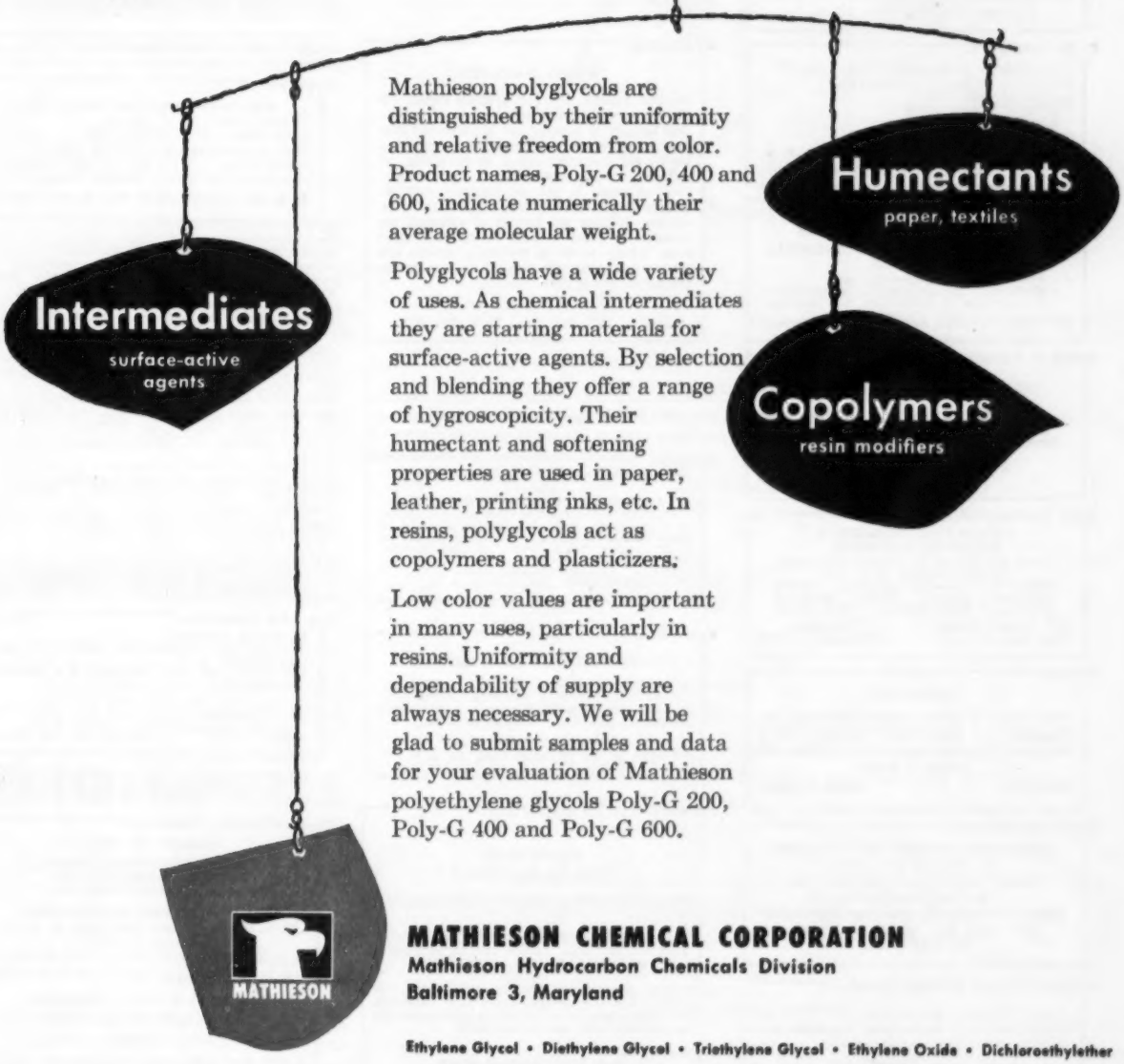
WORLD'S SMALLEST cyclotron is tended by University of California researcher during trial run. The new instrument accelerates electrons through solid matter in a spiral orbit only a few hundred thousandths of an inch in diameter. Germanium is the key; when the right combination of electrical forces is applied to a germanium crystal, one of its electrons whirls around just as if it were being accelerated in a conventional cyclotron. The midget accelerator is playing a role in studies of metals, insulators, semiconductors.



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cess of the program will be gauged by how well it helps research men fulfill three primary requirements: (1) become oriented in the company; (2) develop a high degree of scientific skill; (3) increase personal effectiveness.

It's a golden opportunity for self-improvement. But Shell doesn't look upon the program as a finishing school. One Shell executive frankly puts it this way: "The sole reason for training a man beyond the academic learning with which he arrives is to help him become a more effective employee."

•

Triple Interest: Three research reports rank high on the list of interest-sparkers out of the American Chemical Society's recent Kansas City national meeting.

• Five new finishes for glass fiber-reinforced plastics were unveiled by Porter Erickson of the Naval Ordnance Laboratory (Silver Spring, Md.). The compounds—which form a strong bond between the resin and the glass—comprise allyltrichlorosilane and products of its reaction with resorcinol, phenol, *m*-cresol, and xylenol. Collectively, the group enhances the bonding of glass fibers to phenolics, epoxies and polyesters.

• Phillips Petroleum Co.'s (Bartlesville, Okla.) J. E. Wicklatz gave the word on new polysulfone resins produced by emulsion polymerization of hydrocarbons and sulfur dioxide. Polymerization of hydrocarbons and sulfur dioxide, not especially new, is generally accomplished by a pressure reaction. But products of this method are either hard-to-recover solids or costly syrups requiring uneconomic quantities of sulfur dioxide. Product of the Phillips technique is claimed to be a reactive, easily processed emulsion.

Because the new process is applicable to a variety of hydrocarbons, it could be the springboard to a prolific brood of plastic materials. Blends of polysulfones with nylon and synthetic rubbers are also coming in for study.

• Safety is the outstanding attribute of a new anesthetic synthesized by chemists of Wm. S. Merrell Co. (Cincinnati, O.). It's 5-ethyl-6-phenyl-*m*-thiazine-2,4-dione, has shown a safety ratio (lethal dose/sleep-producing dose) of 15 to 1 in animal tests. Most available hypnotic agents have safety ratios of from 4-6 to 1.

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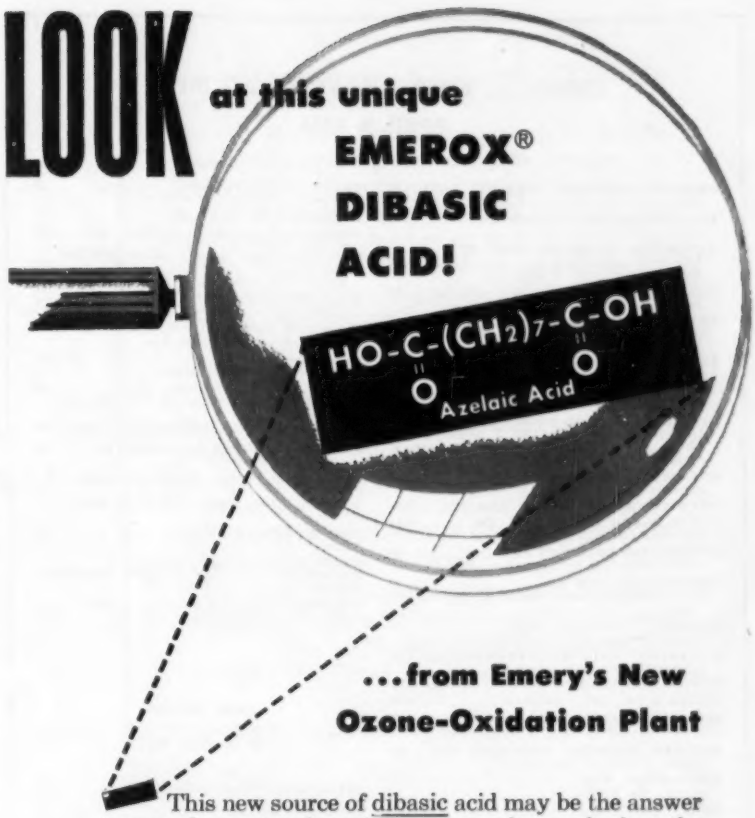

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Pittsburgh 22 738 Oliver Bldg., Atlantic 1-4707

St. Louis 8 3615 Olive St., Continental Bldg., Lucas 4867

RESEARCH . . . . .

and agricultural chemicals. According to Goodrich, 1% of the gum will transform water into a clear stable gel. A white, free-flowing, hydrophilic colloid, the new product doesn't hydrolyze, is reported to be impervious to attack by microorganisms. "Furthermore," states Goodrich, "the viscosities of Carbopol 934 solutions are relatively unaffected by aging and temperature changes."

•

Tally: Here are the just-disclosed vital statistics for last year's operations at Stanford Research Institute.

- Business volume for the year totaled $5.4 million, 19% above the 1952 mark.
- At the close of 1953, annual rate of contract research was pegged at $6.5 million.
- More than 340 clients sponsored 382 separate studies; SRI itself accounted for 39 of these projects.
- Proportion of government contracts declined from a high of 61% (of the work load) in the first quarter to 49% at year's end.
- About $380,000 was invested in new equipment and plant improvement; staff expanded 30%.

•

New Contender: General Electric has no corner on this week's polyethylene news (*see p. 69*). From Bartlesville, Okla., comes word of Phillips Petroleum Co.'s new polyethylene. Phillips terms it "entirely new and superior," says it is stronger and tougher than presently available polyethylene, has greater resistance to heat and water vapor penetration. Tradenamed Marlex 50, the new material—Phillips avers—"opens up entirely new uses for polyethylene, such as nonbreakable baby bottles and other vessels that must be steam-sterilized." To handle initial production of the new plastic, the company plans to build a semicommercial plant at Adams Terminal, Houston Ship Channel (Tex.).

•

Hybrids: New vehicles for protective coatings are now emerging from the research laboratories of Dow Corning Corp. (Midland, Mich.). Copolymers of silicones and oil-modified phenolics, they're designed to supplement phenolics, impart better resistance to heat, moisture, chemicals and weathering. The first two hybrids bear the tags XR-875 and XR-859. They can be baked in the 400-500 F range, also air-dry to a hard film. Potential uses: in spar varnishes, maintenance paints and specialty coatings. Current availability: lab quantities.

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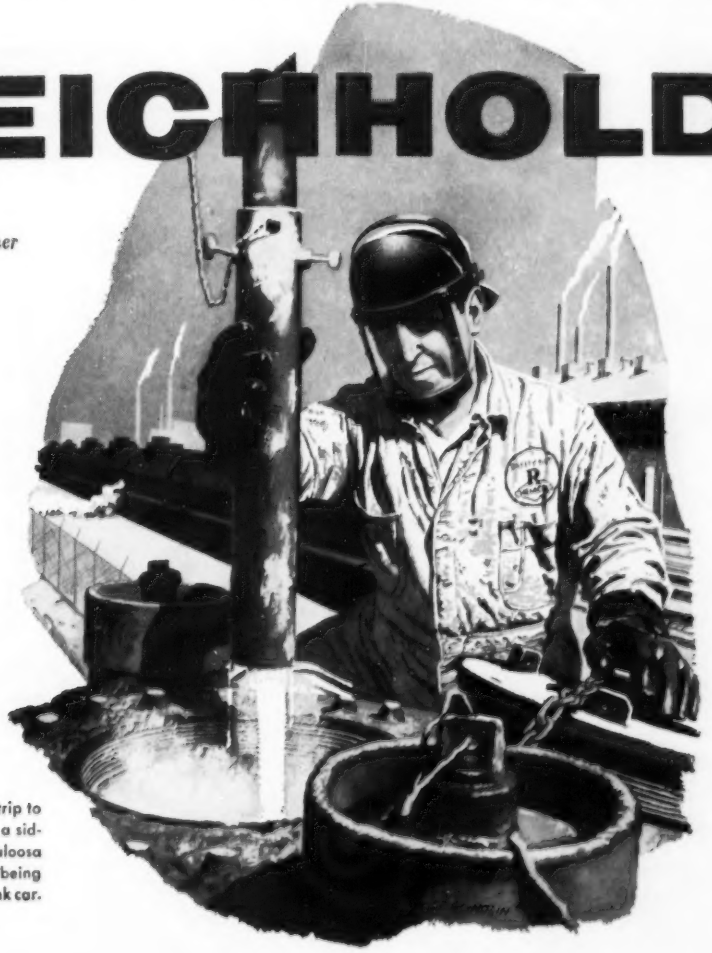

Phenol starts its trip to a customer from a siding at RCI's Tuscaloosa plant where it is being loaded into a tank car.

Formaldehyde
Glycerine
Maleic Anhydride
Phthalic Anhydride
Phenol
Sodium Sulfate
Sodium Sulfite

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In the second decade of vinyl plastics technology, FLEXOL plasticizer DOP remains the outstanding plasticizer for vinyl chloride resins. If you are compounding vinyl resins, you can be sure that FLEXOL DOP, with these valuable properties, will give your product stability and durability. A permanent partnership that will stand the test of time.

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on FLEXOL plasticizer DOP, write to the district office nearest you for a copy of "FLEXOL Plasticizers" (F-5882). There are 21 offices located in principal cities. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

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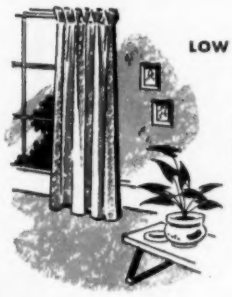
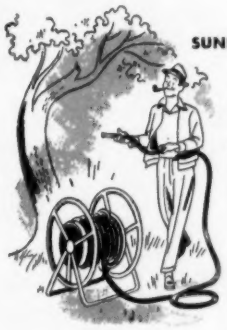
Vinyl resin floor tile, plasticized with FLEXOL *DOP stands up under daily use in playrooms, libraries, kitchens, and retail stores.*

LOW VOLATILITY



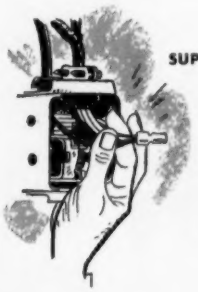
Vinyl drapes plasticized with FLEXOL *DOP are still in service after ten years of constant use.*

SUNLIGHT AND WATER RESISTANCE



Plastic garden hose containing FLEXOL *DOP does not stiffen through water extraction and withstands long term sunlight exposure.*

SUPERIOR ELECTRICAL PROPERTIES



FLEXOL *DOP is the most widely used plasticizer in building wire compounds.*

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